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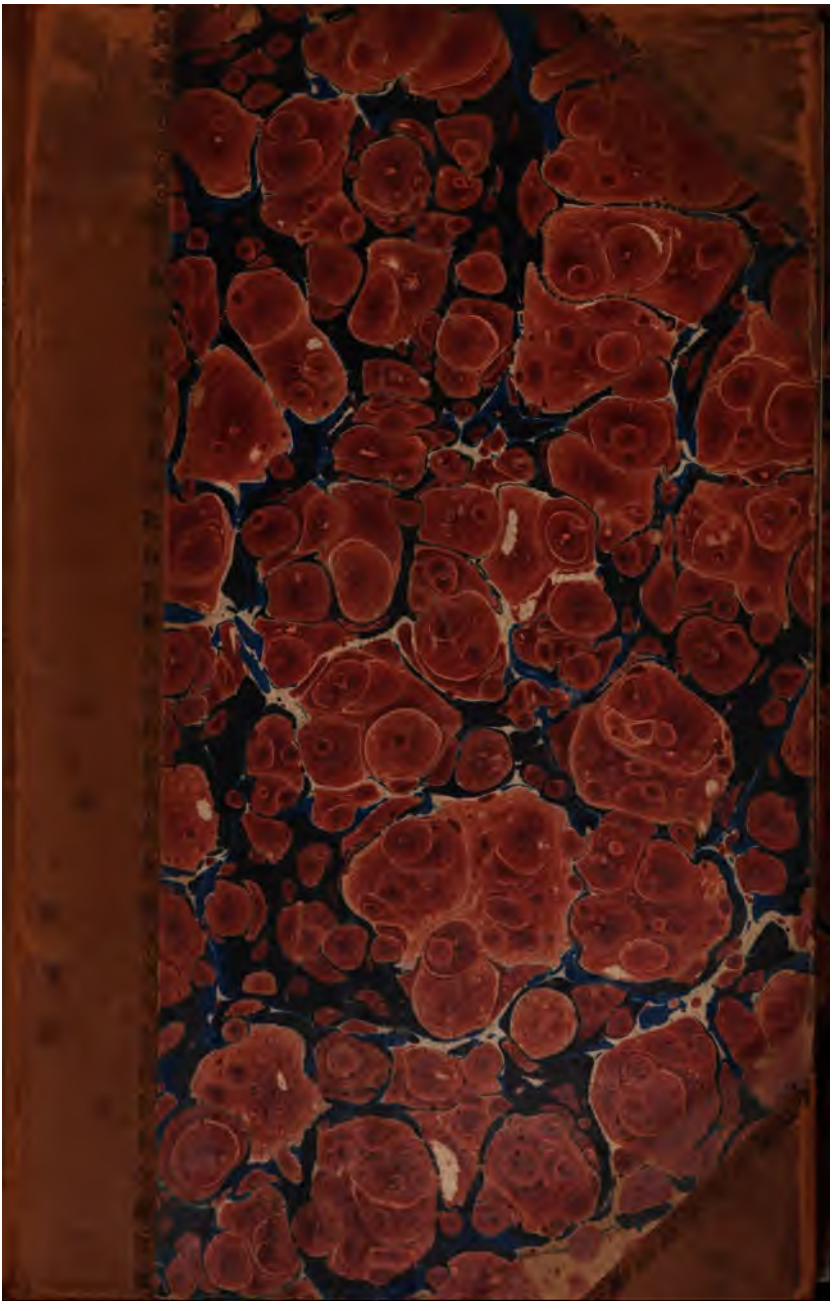

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A

POPULAR TREATISE

ON

DIET AND REGIMEN;

INTENDED AS

A TEXT BOOK FOR THE INVALID AND THE DYSPEPTIC.

BY

W. H. ROBERTSON, M.D.

LONDON:
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PREFACE.

THIS book has been written partly for the convenience of my professional brethren, to save them much trouble and time; in fact, to put their patients in possession of general principles, without attempting to interfere with the application of those principles to individual cases of serious disease. It has, however, been chiefly written for the benefit of the careless, or unthinking, or ignorant invalid. It carries with it its own apology, and must be criticised, whether it meets with praise or censure, according to individual opinion of its deserts. All I can say in its defence is, that it is offered with humility, and with good intentions to the public.

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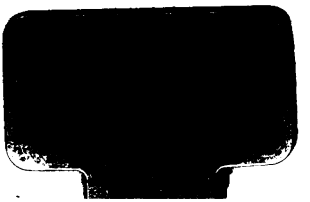

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INTRODUCTION.

It has often struck me that a work on the diet and regimen best adapted to the preservation of health, and the cure of disease, might prove acceptable to the great mass of the thinking public.

Such is the work to which these observations are introductory.

I would at once, at the outset of my undertaking, denounce as useless, or worse than useless, works on "*popular medicine;*" works professing to teach the public to treat their own diseases—at all events, many of their diseases—without the assistance of the medical practitioner. There is no science so apt to mislead the superficially informed, as that of medicine. This may, it is

true, look like a truism—like the assertion of a fact too well known, too generally admitted, to render a formal mention of it needful. Every one knows that almost all medical students, generally young men with constitutions uninjured by time or serious ailment, fancy themselves to be martyrs to almost every disease that they study or read about; and is it likely that, in forming a diagnosis of his own complaints, the man over whose head more years have passed, and who is probably, or at all events possibly, suffering under some more serious malady, will be more accurate in forming such a diagnosis? and how far less likely is it that he should *treat* his own case with the proper remedies? Enough has been said to show that popular works on medicine are only like "edged tools in the hands of children"—are either the consequence of well-meaning medical men placing too much confidence in the judgment of the public, or are the mere results of a quackish desire for notoriety. But am I overrating the liability of the public to be led astray by this

sort of temptation to become each man his own physician? No! on the contrary, I must go a step higher to be on a level with the magnitude of the evil. So far, erring as the result proves the principle to be; yet so far there is certainly something feasible in the idea; for certain general facts are stated, diseases are treated of, the symptoms of each given, and a mode or modes of administering to each disease set forth. But although it is next to impossible for any man to tell what is the disease with which he himself is afflicted, by coming over the histories of several diseases, however accurately these histories are drawn; and, although even if he does happen luckily to hit upon the right disease, he has, if possible, still less chance of treating it with the remedies which are suitable to its stage, the preminency of this or that set of symptoms, with the remedies which are adapted to his own powers and those of the malady; although, therefore, the notion of, in this way, making each man his own physician, is sufficiently absurd; yet the *public*—may I not call it the

gullible public?—is content to swallow a far larger bolus, and on evidence the very worst, because it is given by interested parties; evidence which goes so far as to carry with it its own contradiction; evidence which is almost always laughed at, even by the very persons gulled; yet on such evidence as this, men and women,—aye, and men and women of refined minds and cultivated understandings,—people of good common sense, are to be found in every part of the country, in every town, village and hamlet, ready to swallow the pills, or the drops, or the powders of any one, no matter who, that has impudence enough to assert that they will cure any or every disease *. Is it possible that, while nine-tenths of our population are capable of becoming such easy dupes to such unblushing imposture, this can be called an intellectual age, or the people of Great Britain the most thinking people in the world?

* "One that trusts to a false guide is in greater danger of being led astray than he who trusts to his own eyes, though he should be but indifferently acquainted with the road."—*Reid's Essays on the Intellectual Powers.*

This may, however, be thought to be mere wordy declamation, and proofs and illustrations of the grossness of the error, of its unreasonableness, may be looked for from one of the medical profession; which body of men may be thought by the unthinking to have no better reason for decrying quackery, than quackery has for declaring medical aid to be useless. The illustration which I have selected to confute such, is one that will, I think, satisfactorily prove what has been stated above, and, at the same time, will prepare the reader for some of the remarks that will be made in the subsequent chapters of this work. The illustration is indigestion. Now digestion, as most people know, is the name given to that series of functions by which food is taken into the system, and assimilated, and formed into blood; from which blood the various tissues are constantly undergoing renovation, and the various secretions are formed. Digestion consists, then, in the mastication of the food, its complete admixture with the saliva, and having passed into the stomach, its reduction

into a pulp by the muscular powers of the stomach; and, having been chemically acted on by the gastric juice, its propulsion thence into the bowels; its mixture with the bile; its separation into chyle,—which is the nutritious part, and is taken up by certain vessels and carried to the blood,—and into excrementitious matter, which is propelled downwards through the bowels to be ultimately discharged: the separation of the chyle from what is excrementitious, constantly going on in the whole track of the intestines. We have here, then, a series of functions to be performed, the whole series going by the name Digestion. Each of these functions may be in a state of greater or less deviation from health; and such deviation may be, and most such instances of deviation are called indigestion. Dyspepsia or indigestion may then result from the imperfect mastication of the food; or from a defective secretion of gastric juice; or from the gastric juice being in an unhealthy and vitiated state; or from a weakened condition of the powers of the stomach

from a relaxed state of its fibres; or from the lining membrane of the stomach being in a state of irritation, or of inflammation; or from a defective, or a vitiated secretion of the bile; or from an irritable, or an inflammatory condition of any part of the intestinal canal; and each of these varieties requires a different modification of treatment, some of them modes of treatment diametrically opposite. Would any one treat a relaxed or weakened state of the fibres of the stomach in the same way that he would treat an inflammation of its coats? and yet for both these the monger of nostrums, the maker of "antibilious pills," would order the self-same medicines. In addition to the above it may be stated that it is seldom that each of these varieties occurs singly, and by itself. Every organ and every tissue of the body is so intimately related to its other organs and tissues, that any one can scarcely be affected without involving others to a greater or less extent; and these combinations increase the varieties of cases of indigestion, and, like ring-

ing changes on a peal of bells, render it, at best, unlikely that any man should have to prescribe for two cases which are in all respects similar. And this indefinite addition to the varieties of indigestion does but show, still more clearly, how next to impossible it is that a man should treat his own case correctly; how perfectly absurd is the practice of using a single remedy against so infinite a diversity of evils.

But I have done with this. I wished to satisfy my readers, that this is not a work on *Popular Medicine*. I will not say more, because I fear that, as long as a man can be found ready to impose on public credulity, people will be found as ready to submit to the imposture.

The pretensions which I venture to set up in behalf of this work are of a very different sort I have in my practice found, that even the educated, and those who, on most points, have enough information to serve their purposes, are lamentably ignorant on matters that are familiar to every one connected with the profession of Medicine. I call this ignorance lamentable,

because I am sure that it leads to much mischief; to many a premature grave; to the untimely loss of many a parent, the heart-rending bereavement of many a child. But I am not now about to individualise. I am not about to enter into separate instances; the memory of every medical man is rife enough with such dismal images.

My aim, and the aim is a high one, is to give the public a means of correcting this ignorance; to inform them on points of which every medical man knows them to be ignorant; and knows too how important it is that they be, as far as possible, informed. These matters are so familiar to every member of the profession, so completely are they things of every day importance, that they form, more or less, subjects of every day repetition. But the time of most men in active practice is too precious to be thus spent in long and, because so often repeated, dry reiterations: besides, it is almost impossible for him to remember, at all times, the utter ignorance of the patient on points which he himself

has so long known; and the consequence is, that these matters are often, very often, left either altogether untouched, or but superficially mentioned. But, to push the question still further, this sort of information is likely to be at least as useful, if not more useful, before any one would think it needful to apply to a medical man at all, as at the time of the application, or afterwards; and this is my strongest motive for writing the observations, and giving the hints, which the reader will find in the following chapters.

Further I may be allowed to say, that there are remarks, the result of observation, that there are theories deduced from it, which are not common-place; and which, as far as I know, are new, and my own. The medical reader will recognise these readily; the non-medical reader will be indifferent about distinguishing what is new from what is old.

ON

DIET AND REGIMEN.

CHAPTER I.

Non est vivere, sed valere, vita.

MART.

But the invalid may ask—"Can I not have my ailments removed without abridging my appetites?" No! And the practitioner, who undertakes the treatment under such conditions, betrays either a want of principle or a want of judgment.

DR. JAMES JOHNSON.

IN a work like this, the regulation of the diet is a matter of first rate importance, secondary to nothing; whether we look to the beneficial effects which follow an adequate attention to it, or the serious consequences which are the result of its neglect.

Is it to be wondered at that, in a commercial country, where sedentary occupations are the

lot of a majority of the people, and a mode of living which may, with much justice, be characterised as *omnivorous*, is within the reach of all but the lowest grades of society, so few should be found who are perfectly free from stomach disturbances, who know not what indigestion means from their personal knowledge? There are, as far as my experience goes, but few instances of such perfect health; and there are therefore few who are in a situation to laugh at all dietetic regulation, and to eat, without risk, whatever is put before them. But even the few who have such perfectly unimpaired powers of digestion will be found chiefly to consist of those who live, and always have lived, plainly and frugally; who have, either from necessity or from habit, *dieted themselves*. The few, the very few among them, of whom this cannot be said, are, if middle-aged, men who have taken a great deal of exercise; or they are the young, who have had constitutions of iron to begin with; which constitutions sometimes take much hard work to wear them out. This may, I well know, be said to be going too far,—to be saying too much; but those who have paid least attention to the subject will be the persons most apt to say so, those who have given

to it much of their attention will, I think, agree with me. Man was destined to earn his bread by the sweat of his brow, to work for his food. Here there is a provision made for that which is so much neglected by all classes, but those with whom it is part and parcel of their occupation, I mean exercise.—Unaided by his fellow men, destitute as yet of the advantages which a division of labour and commerce supply, his food would of necessity be confined to the few simple herbs which his own toil could extract from the earth, or to the animals which he had earned by his exertions in the chace. Here then are two of the first, and the two most important regulations of which modern dietetics inculcate the observance, viz., exercise and simplicity of diet. For the best of all reasons, a man so situated would not indulge in the use of stimulants; he would not know either that they could be procured, or how to procure them; and consequently neither from ale, nor wine, nor spirits would he run any risk. And here we find the third section in nature's scheme of diet, viz., sobriety; and a sobriety, it will be observed, not merely the comparative degree of drunkenness; but positive temperance, complete abstinence from stimulating liquids. This then,

may perhaps be said to be the natural state of man; the state in perfect accordance with which his organs were formed, and all the tissues of his body were fashioned and modified: the kind of diet and regimen from which the more he varies, the more does he oppose the dictates of nature, the more does he expose himself to the influence of disease, the greater risk does he run of essentially curtailing his existence, and the more active and energetic must be the interference of art to counteract as far as possible such consequences, and to spin out the existence of man. This then is the sum and substance; this is the foundation of dietetics; this then is the reason why medical men pay so much attention to the diet, and the regimen, as means of keeping man in health, and restoring it to him when he has lost it *.

I shall now specify the comparative digestibility of the articles which are more usually seen at our tables; of the kinds of food which are ordinarily used by us. They are divided into the two natural classes, animal and vegetable substances. The animal substances are subdi-

* "There is scarcely a malady that can be named which either does not originate from this neglect of diet, or is not increased by it, until the disease at length bids defiance even to temperance itself, and all prescription."—*Dr. Fothergill.*

vided into meat, poultry, the animal principles, game and fish: the vegetable substances into grain, pot-herbs, vegetables eaten uncooked, fruits, the vegetable principles, &c., and liquors, the products of vinous fermentation.

The meats are placed in the order of their digestibility, beginning with those which are the most easily digested; and this is the plan pursued in all the following tables. It may be stated here that this order has been arranged from carefully scrutinised observation; that individual exceptions to every item must of course occur; but I think they will be only individual exceptions.

MEATS.

1 *Mutton.*	3 † * *Lamb.*
2 *Beef.*	4 * *Veal.*
5 * *Pork.*	

These are, generally speaking, more digestible if broiled on a gridiron, still less so if roasted, still less so if boiled, still less so if baked, still less so if fried.

Baked meats owe their difficulty of digestion to the empyreumatic or burnt oil into which more or less of the fatty matters are converted; owing, as it seems to me, to the confined air,

† This mark (*) opposite to any of the substances in this or the following tables signifies that such are articles generally found to be unsuited to the dyspeptic.

the want of ventilation in ovens. It is this oil which gives the peculiar flavour, recognisable by most, to meat, or anything containing fat, which is cooked in an oven; consequently, if the great object, a sufficiently high temperature, could be secured in connection with free ventilation, I think that baked meats would probably be as digestible as roasted.

Meat somewhat underdone is more digestible than if thoroughly cooked; for the obvious reason, that in the latter case the fibres are more contracted, more hardened, and therefore require more power, greater exertions of the stomach to separate their particles and convert them into pulp. For the same reason salted meats are much more indigestible than fresh meats; the salt contracting and hardening the fibres, and rendering them tougher, and therefore less yielding to the comminuting powers of the stomach and the solvent power of its secretions.

The degree of digestibility of each kind of meat will necessarily vary much according to the *age* of the animal, and the *part* which is eaten. It will be observed that the flesh of the full-grown animal is more digestible than that of the animal which is still growing; but this remark applies only to animals the flesh of

of which goes commonly by the name of "meat."

I think it necessary to direct the particular attention of the non-medical reader to the fact that I have *marked* veal as being difficult of digestion; because it is a very common error to suppose it a proper article of diet for the invalid and convalescent. Veal whether roasted, boiled, or stewed, or however cooked, ought to be banished from the sick-room. The invalid, unless he enjoys a very peculiar idiosyncrasy, will generally find it to disagree with his stomach.

The flesh of an animal which is killed in good health, and good condition, is much more digestible than that of an animal which is either sickly, or lean and spare of flesh, at the time of its being killed. The more free the part eaten is from skin, cellular membrane, and fatty matters between the fibres, other things being equal, the more digestible will it be. All the glandular parts however, or, as they are called, the organs, are difficult of digestion, to which class belong liver, kidney, tripe, heart, tongue, &c.

Animal food is almost invariably more easily

digested if it has undergone some degree of putrefactive change; at least so much of such change as is sufficient to make the fibres more tender. If the change has gone a little further than this it generally nauseates; and either interrupts or disturbs the digestive process *.

It seems necessary that a word or two should be said in this place about bacon, which is now so much vaunted as a remedy for indigestion. In the great number of cases, I do not hesitate to say that it must do harm,—in all cases where the juices of the stomach are either deficient in quantity or vitiated in quality; where the tissues want power, or where they are in a state of inflammatory excitement; in fact in all cases where the indigestion has its *seat* in the *stomach*. But in cases where the juices of the stomach

* Although not exactly relevant to my subject, it may not be quite uninteresting to the general reader if I mention that the gastric juice has extraordinary power in counteracting and correcting putrefaction. This is, perhaps more the case in some animals than others, as in those that feed on carrion; but it is likewise the case in man. It *explains* the fact, that more or less putrified meat may be eaten with impunity, which, but for this beautiful provision of nature, absorbed in an uncorrected and unaltered state, would taint the whole system, and would undoubtedly either destroy life, or put it in most imminent risk.

are sufficient in quantity, and healthy enough in nature to mix with the food, and act on it chemically; where the contractile powers of the stomach are sufficient to grind the mass into a pulp; in short, in all cases in which the food is digested by the stomach, is ejected in the proper state into the bowels, and where all that is wanting is a *stimulus* to carry the mass forwards through the intestines; the laxative properties of the fat, and of the salt contained in the bacon, will act beneficially, and to such cases, bacon will, no doubt, be of service. But, as I have said, such is far from being the general cause of indigestion; a comparatively small number of the cases that we meet with are of this nature, and consequently I would advise the dyspeptic to resort to it most cautiously, unless he is guided by the advice of his medical attendant.

POULTRY.

1 *Fowl.*	3 * *Duck.*
2 *Turkey.*	4 * *Goose.*

Of birds in general it may be said that they are digestible in proportion to their *youth.* It will be observed that I have *marked* duck and

goose as being of difficult digestion, and it is an observation which may be applied, with few exceptions, to all water-birds. They are much fatter, their flesh is tougher, and it is so thoroughly mixed up with fatty cellular substance, that the *civilised stomach* must either have a most happy and unusual idiosyncrasy, or else be in a state of unusual healthiness, to bear either duck or goose without inconvenience.

Chicken broth is so often used in the sick-room, that this seems to be a proper place to make a few remarks upon it, and upon broths in general, as articles of diet for the invalid or the dyspeptic.

The first great objection to broths is fat, more or less of which they almost always contain, unless they have been allowed to stand until they have become quite cold, and the fat, then risen to the surface, has been taken off; the broth being warmed up for use. This objection may in this way always be got rid of; the next to be mentioned is made of sterner stuff. The dyspeptic will usually, and the debilitated invalid will not unoften find, that much *liquid* of any sort, however harmless, will

produce a sense of fulness and uneasiness in the stomach, with or without other symptoms which mark disturbance of its functions. I shall have occasion, by and by, to revert to this subject. This effect is very apt to be produced by all sorts of *unthickened slops*. They do not afford sufficient *resistance* to the contractile powers of the stomach, to enable those powers to act on and digest them. There are cases, of course, which are exceptions to this remark; but so general is the rule, that it is seldom, I think, right to order unthickened chicken broth, or mutton broth for my patients. Thickened with arrow-root, or with any of the simple farinacea, they often agree well, and form a palatable and nourishing diet.

Broth with vegetables in it, is, for reasons which will be understood by referring to the remarks made under that class of substances, highly objectionable, and should never be eaten by the dyspeptic.

GAME.

1 *Hare, hunted.*	5 *Grouse.*
2 *Partridge.*	6 *Ptarmigan, Black-Cock.*
3 *Pheasant.*	7 *Hare.*
4 *Venison.*	8 *Snipe, Woodcock, &c.*

No one of these can be pronounced to be difficult of digestion. The long-billed birds are the most doubtful; they do disagree at times, and by the decided dyspeptic they ought not to be eaten. Game leaves the stomach very soon, and seldom gives it much to do. The distinction which is made in the above table between the digestibility of hare that has been killed by hunting, and one which has been in any other way deprived of life, may surprise some, but there is perhaps no *solid* article of food which leaves the stomach so soon as hunted hare. The only article, about the place of which in the above table I am doubtful, is venison. This doubt is attributable to the way in which it is usually cooked. I think few who had eaten a broiled venison steak would have reason to find fault with its digestibility.

Some writers have laid much stress on the *part* of an animal which is eaten; and have directed the invalid to eat only *this* part of *this*

animal, or *that* part of *that.* I will content myself with simply saying that the part, the fibres of which are the most tender, and the most free from skin, fat, or cellular membrane, is the part of every animal which is the most easily digested.

ANIMAL PRINCIPLES.

1 *Gravy.*	3 *Fibrin.*
2 *Gelatin.*	4 * * *Fatty Matters.*

In the above table the common animal principles are classed in the order of their digestibility.

Under the first head gravy, I include simple beef-tea, made very strong, from lean beef, allowed to cool, the fat, then risen to the surface, wholly removed, and warmed up for use with the addition of only a few pepper-corns and a little salt. This is a kind of food which agrees well with the stomachs of most dyspeptics, at all events with most of those whose cases are not to be looked upon as severe. The use of broths I have spoken of elsewhere.

Gelatin is in general of easy digestion, and the stomach which is labouring under mere debility, as during convalescence from severe and

exhausting illness, will usually find jelly from calves' feet, ivory dust, &c., a grateful and palatable, a safe and unirritating step from farinaceous to more solid animal food. But this remark is hardly applicable to the dyspeptic stomach, to the stomach which, if suffering from debility, is seldom suffering from debility alone. When the gastric secretions are deficient or disordered, when the stomach is irritable, or when it is perhaps suffering from chronic inflammation, I think jelly will usually be found to be objectionable. I must say that I had rather, speaking generally, see a dyspeptic patient of mine eat a somewhat underdone broiled mutton-chop, than jelly of any sort, made in any way, or from any source.

It seems necessary to direct attention to fatty matters, which are placed lowest in the table and marked very indigestible; and by this term is meant not merely fat, but likewise skin, cellular membrane, &c. Fat affords very much more nutriment than does lean, if it be digested; but it matters little what a man eats, or how much nutriment his food may contain, if that food is not assimilated; if it is not formed into blood.

FISH.

1 *Whiting.*
2 *Haddock.*
3 *Cod.*
4 * *Flounders and Soles.*
5 * *Lobsters and Crabs.*
6 * *Oysters, raw.*
7 * * *Fresh-water Fish in general, as Trout, &c.*
8 * * *Turbot.*
9 * * *Salmon.*
10 * * *Oysters, cooked.*
11 * * *Herrings and Sprats.*

Taken in the aggregate, fish may be thus classed in the order of their digestibility:—white-fleshed fish, flat-fish, shell-fish, fresh-water fish, red-fleshed fish, and, lastly, herrings.

Fish, at least those which are *unmarked*, if simply boiled, and eaten only with salt, and little or no butter, are of very easy digestion; but if they are salted, or fried, or eaten with rich sauces, they are so no longer.

Oysters are usually thought to be of easy digestion. I have been led to form an opposite opinion. I think even raw oysters questionable, if the stomach is much out of order; but cooked oysters are anything but easily digested, and they should be shunned by every *valetudinarian;* for there is scarcely a disease which flesh is heir to, with which the stomach does not sympathise, and which is not in imminent risk of being made worse by a fit of dyspepsia.

Another important article of diet to be spoken

of under the head of animal substances, is milk, which, of all kinds of animal food, seems to be the one which is the most *natural*, and therefore would, *à priori*, strike the mind as being the one most likely to be easily digested: and it does agree with the stomachs of most men, its use being attended with only one inconvenience, and this does not by any means always apply. It often, if regularly used, constipates the bowels, and thus deranges the process of digestion. This is far less likely to happen, if the milk is thickened with flour or oatmeal; and then it forms a diet which most people like, and which is very generally wholesome. Milk is, of all kinds of food, the one which is the best adapted to children; and it should constitute their principal meal, which, in the child, the boy, the youth, and the man, ought to be the *breakfast*. But of this more hereafter. There is a saying very prevalent in Derbyshire, that "cream is lighter than milk;" implying that it does the stomach less harm, and is more easily digested, because it swims on the top of the milk. To whose strange abuse of the meaning of the word *light*, the public is indebted for this singular "saw," I know not. If it were true, that the more specifically light the sub-

stance, the more easy is it of digestion, butter, or fat, or oil would be more easily digested than would water. I should scarcely have noticed this strange doctrine, had it not been for the personal knowledge which I have of its extreme prevalence in this neighbourhood, and had I not seen repeated instances of its injurious consequences. Cream is, then, much more indigestible than milk, and is probably, in this respect, but one remove from butter. The following scale will perhaps show more clearly the relative digestibility of milk and its products:—

1 *Whey.*	5 *Curd.*
2 *Milk, skimmed.*	6 *Butter.*
3 *Milk, unskimmed.*	7 *Cheese.*
4 *Cream.*	8 *Cream-Cheese.*

Need I say that butter is irritating to the stomach of the invalid, is poison to that of the dyspeptic. It is the archdemon, with which all writers on dietetics have warred; it is the thing with which invalids seem to be least able to dispense, and yet it is the thing which perhaps does them most harm. If eaten at all it should be eaten sparingly and cold. Melted butter, whether on toast or in sauces, should be banished from the table of every valetudinarian. I have, however, known instances of people,

who have hardly ever *felt* that they have such a thing as a stomach, in whom butter acted as a gentle laxative, and to whom it proved serviceable. Children should not be allowed to eat butter. Indeed childhood is the age at which a rigorous attention to dietetics is most imperatively called for, both as the means of warding off the diseases of early life, and mitigating their severity when they do occur, and as the means of laying a foundation for temperance in after life.

Cheese is generally very difficult of digestion. The impunity with which most persons can eat toasted cheese, may probably be attributed to the great quantity of mustard which is usually taken with it. Decayed cheese is so notorious for the soothing effects which it produces, when taken as the climax of a *dinner*, that, if unnoticed, it may be thought by some to contradict the assertion, that cheese is difficult of digestion. Decayed cheese has, in fact, ceased to be cheese properly so called; it has to a considerable extent undergone decomposition, and has become a decided stimulant, which may be considered to exert much the same effect on the stomach as spices, or other stimuli: in fact, I have seen cases in which it has produced considerable irri-

tation in the stomach and bowels. But if people will eat to repletion; if their insatiate cravings and *gourmandise* will roam from soup to fish, from fish to meat, from meat to poultry, from poultry to game, from game to confections, more than one stimulus is necessary to goad the stomach into an effort powerful enough to concoct the heterogeneous mass; and, as one of these stimuli, decayed or decaying cheese is probably almost as harmless as any other.

The last of the articles of animal food which I shall mention is the egg—an important feature in every cookery book; it is little less important in a work on diet. The *yolk*, although it contains an oil which might have been thought likely to disagree, very generally suits the dyspeptic stomach; if *lightly boiled*, its digestion is hardly ever *felt*. Not so the *white;* this almost always irritates and does mischief to the disordered stomach, and by the dyspeptic or the invalid it should not be eaten. The same observations to some, but not to an equal extent, apply to eggs when looked upon as forming part of a pudding; the yolk is still the part which is most easily digested—the white that which is most likely to disagree; but the latter is certainly not so likely to prove injurious as when eaten

alone, and unmixed with other things. There is one other important, because practical, fact, which must be mentioned: the albumen, or white of eggs eaten raw, that is, uncoagulated, is very much more digestible than that which has been boiled, and therefore previously coagulated, or hardened. It is, of course, coagulated by the juices of the stomach; but, why we know not, that coagulation does not offer the same degree of resistance to the solvent powers of the stomach as the coagulation does which is produced by heat, or otherwise, out of the body. The practical deduction from this fact is, that a raw egg is not liable to the objections, on the score of its digestibility, that a boiled egg is liable to; on the contrary, it would seem that there are few articles of diet which are so quickly or so easily digested as uncoagulated albumen.

The second great division of the articles of food, i. e. Vegetable Substances, is now to be discussed.

GRAIN.

1 *Wheat-Flour.*	4 *Oatmeal.*
2 *Rice.*	5 *Barley-Meal.*
3 *Rye.*	6 *Peas-Meal.*

Of these, only the three first are much used in England: the three last are more in request

among our countrymen north of the Tweed than with us.

Bread made from wheaten flour is decidedly more nutritious, as well as more digestible, than that which is made from the flour of other grain; and it is the more digestible the more thoroughly it is baked, without being burned, and the more completely the steam is allowed to escape from it while it is baking. For these reasons ship-biscuit is so very easily digested; for these reasons bread made in *small loaves* is more digestible than when made in *large loaves;* and bread baked in large brick ovens is more digestible than that baked in the small iron oven which is attached to the modern range. In fact, if the oven is small, or the loaves large, several of the products of fermentation are confined in the bread, and add to the difficulty of its digestion. For these same reasons, toasted is more easily digested than untoasted bread; stale bread is very much more digestible than that newly baked. Bread made from *all* the wheat-grain, including the *bran*, is much praised by some, on account of its laxative effects; but the greater number of dyspeptics will find it irritating, and productive of more pain and uneasiness

than advantage: still there are doubtless many, very many, cases with which it agrees, and to which it is of service; but these are not cases in which the stomach or intestines are in a state of morbid excitement.

Pastry is so generally known, so generally felt to be injurious to the weak or the disordered stomach, that in a work on diet its mention is almost unnecessary, only that the omission might possibly be attributed to carelessness or neglect. Pastry, inasmuch as it contains much fat, butter, or grease, of one sort or other; inasmuch as it contains sugar; inasmuch as it is generally eaten as a supernumerary, and therefore superfluous article of diet; inasmuch as it, by variety, often tempts to repletion and overloading of the stomach,—ought to be discarded from the table of the man whose digestion is either debilitated or deranged. But if the man is in a state of moderately good health; and yet his occupations are not so laborious as to render a full meal of animal food either necessary or proper, simple pudding, or even very commonly made pastry, is to be advised rather than otherwise. It may be further observed, that children do not require, and indeed, unless habit has vitiated their appetites, do not usually like much animal food.

Simple puddings, such as those made of rice, or sago, or the common batter pudding, or, to be used more sparingly and less often, even those made of recent or preserved fruits, sur rounded with a very common and plain crust, are much to be preferred, as the basis of their dinner, to the daily increasing practice of loading children's stomachs with animal food, for which they have a natural distaste, and which, so far from being of service, is generally injurious to them.

Rice is a most easily digested article of diet, one which is light and unirritating, and one which, if its insipidity is relieved by the addition of milk, or preserved fruits, or if taken instead of vegetables, furnishes an agreeable change and palatable resource to the invalid.

The oat must be mentioned, as furnishing us with the kind of food which is, beyond all doubt, the most easily digested; and which, let the stomach be in what state it may, if it can but retain, it almost always digests: I mean gruel. This is made from grots, which are oats freed from the husks, and from oatmeal. It matters very little from which of these the gruel is made; the great object is to have the gruel thoroughly *boiled*. An hour is little enough time for the complete cooking of the meal or

the grots. If made from grots, they ought to be carefully separated from the gruel by straining, and they ought *never* to be *eaten*. Barley-water ought likewise to be noticed as being the best of all diet-drinks; one which agrees with almost every one; one which, in cases of irritation of the lining membrane of the stomach or the bowels, or where the gastric secretions are acrid, is most useful in soothing the irritation, and in defending the stomach from its vitiated juices. Nor is either gruel or barley-water so destitute of nutritive powers as is commonly supposed. An invalid, using little or no exertion, and with debilitated powers, would hardly, or in very rare instances, digest every day, and assimilate more nutriment than is contained in between a pint and a quart of gruel, and as Dr. James Johnson remarks, in decidedly the best work which has ever been published on indigestion*, "no person is in danger of starvation who can take a pint, nay, only half a pint of good gruel in the twenty-four hours."

* "An Essay on Morbid Sensibility of the Stomach, and Bowels, by James Johnson, M. D. Physician Extraordinary to the King."

POT HERBS, ROOTS, &c.

1 *Asparagus.*
2 *Cauliflower, the heart.*
3 *French Beans.*
4 *Potatoes, if dry, or as it is called, mealy*
5 *Spinach.*
6 * *Turnips.*
7 * *Broad or Windsor Beans.*
8 * *Cabbage or Greens.*
9 * * *Carrots.*
10 * * *Parsneps.*
11 * * *Peas.*

The whole of the individuals in the above list are to be looked upon by the dyspeptic as suspicious articles of food; as being *likely* to disagree; and consequently the effects which they produce on the stomach, during digestion, ought to be noticed. In point of fact, food should never be felt in the stomach at all; and whenever it is felt, to however small a degree, there is evidence that the functions of the stomach are deranged; and that the food has not been adapted to its powers or its condition. Asparagus, eaten with salt only, without butter or sauce, almost always agrees; yet there are cases of dyspepsia in which even this produces disturbance. As the article stands lower in the list it is, of course, more indigestible. The *marked* articles ought, at all

* It will be observed, that several of the pot herbs occasionally seen at our tables, are not included in the above list; they have been omitted, lest from its length confusion or error may arise.

times to be shunned by the dyspeptic; and even the others ought always to be eaten by him *sparingly*, without sauce; and their effects to be carefully watched.

VEGETABLES, EATEN UNCOOKED.

1 *Water-Cress.*
2 *Mustard.*
3 *Cress.*
4 *Lettuce.*
5 *Celery.*
6 *Radish, if the acrid rind is removed.*
7 * *Onion.*
8 * * *Cucumber.*

The three first mentioned articles in the above list, water cress, mustard, and cress, contain each of them, a peculiar essential oil, which is palatable to most, and is a very grateful stimulus to the stomach and the appetite.

Lettuce contains a narcotic principle which is the reason why they should not be eaten unrestrainedly, unless in the evening.

Celery, if quite *sound* and *fine*, and only the centre is eaten, almost always agrees even with the confirmed dyspeptic.

The digestibility of radishes is more doubtful; but if they are carefully scraped, to free them from the acrid skin, they may be tried *cautiously*.

Onions ought to be avoided by most dyspeptics.

Cucumbers ought never to be eaten. This

is one of the few points on which "*doctors* do not *disagree*."

FRUITS AND SEEDS.

1 *Orange.*
2 *Strawberry.*
3 *Raspberry.*
4 *Pine-apple.*
5 *Grape.*
6 *Currant.*
7 *Gooseberry.*
8 *Peach, Nectarine, Apricot.*
9 *Apple, Pear.*
10 * *Cherry.*
11 * *Plum.*
12 * *Walnut, Chestnut.*
13 * *Hazel-nut, Filbert.*
14 ** *Melon.*

The above is a tolerably long list of the fruits and seeds which are usually procurable in England, and important from being generally used. A few observations are all that I shall indulge in. The *juice* alone ought to be swallowed; the skin or other matters ought in most cases to be rejected. Perfectly ripe fruit, eaten in moderation, and at proper times, seldom does harm. The *acidity* of fruits is that which constitutes their chief objection; and the dyspeptic must, at all times, eat them with much caution. Fruits ought not to be eaten by him after his meals, for then not only are they unnecessary, but they are worse; they interfere with the process of digestion, and not unoften wholly interrupt it. The best time for eating fruits is

the forenoon, between breakfast and dinner. The stomach is then in that state of repose which fits it for their digestion, by devolving to them its whole attention, an attention undisturbed by other business. If, then, the time at which fruits are eaten is attended to; if the juice only is swallowed, and if they are partaken of sparingly, and if those *marked* as indigestible are avoided, they will seldom do harm. But after all, a man must attend to his own sensations, and judge of the propriety of eating them by their effects on his stomach.

It is imperatively necessary that I here mention the foreign dried fruits, both because they are very much eaten, and because almost everybody thinks them to be so perfectly harmless, so easily digestible, that the unpleasant effects produced by them are hardly ever attributed to them, but are more usually laid upon some other article of diet, which is perhaps no more, perhaps not so much to blame as they are. I have said that the skins of fruits are very indigestible; in fact, the most of them are not digested at all, but are parted with in exactly the same state as they are swallowed. It is so with dried fruits; and as it is evidently impossible to eat *them* without swallowing the skins, they often irritate

the lining membrane of the *prima via*, and particularly the lining membrane of the lower bowels. Dried currants or plums ought not then to be put into the invalid's pudding or bread. The dyspeptic ought seldom, if ever, to eat them. It is a common practice to put a few dried currants into the pudding made for the sick-room; it is a common practice to add a few dried currants into bread made for a man who is debarred from the use of butter. Let me hope that these observations may be a partial means of causing the practice to be discontinued.

For the same reason, if preserves are to be allowed to the sick or the dyspeptic (a practice by the way which is not always judicious) it is well to prefer jelly, or the juice and pulp made into a confection with sugar, to jam, in which the skin and seeds are likewise present. Of the various preserves, I would direct the invalid's attention to "Scotch Orange Marmalade," as being one of the best and most soothing to the dyspeptic stomach. It is made of the bitter Seville orange. It acts as a grateful stimulus to the stomach, while it somewhat soothes its irritability. The great objections to orange marmalade are the sugar and the skins of the oranges. It ought to be made for the dyspeptic with less

sugar than is commonly used, and instead of the skins themselves, an infusion from them will answer every purpose of flavour and tonic, without running the risk of irritating the *prima via* with an indigestible substance. But this and all preserves are improper for the seriously afflicted dyspeptic or invalid. Some of them, however, furnish a pleasant substitute for butter, and are in many cases very properly allowed.

VEGETABLE PRINCIPLES.

1 *Starch.* 2 *Gum.* 3 *Sugar.*

Some may, perhaps, be almost amused at my classing starch among the articles of diet, little thinking that arrow-root, and sago, and tapioca, and salep, are little else than starch. Any of these forms a light and not unpalatable diet to the invalid, a diet which is by most preferred to either gruel or barley-water, to which articles only are they second in point of digestibility.

I have mentioned gum in the above table, and I have done so because it is the principal ingredient in Iceland moss and Irish moss, one of which was some years back, and the latter of which has more lately been much praised as a beverage for the invalid, not to mention other

more important effects which have been ascribed to them. They are only to be considered as a cheap mode of procuring mucilage, the pure state of which is gum-arabic. They are harmless, and easily digested.

Sugar is with much difficulty digested. It is perhaps the most nutritious of all vegetable substances, and perhaps the one which is hardest of digestion. Let the invalid shun it. Let the mother cease to encourage the taste for it in its various shapes, which is common to nearly all children. There is no one solid article of diet which does so much harm, which is the remote, and often unsuspected cause of so much evil. Molasses or treacle, the uncrystallisable portion of sugar, is in general more digestible, and is usually somewhat laxative. When it is sufficiently so, it often carries off its own deleterious effects. The same remarks apply to honey, but to a much greater extent: it is much more digestible, much less irritating to the stomach than either sugar or treacle. It may be mentioned, that several articles of food which in the many disturb the functions of the stomach, act in the few as laxatives, and when such is the case, may, with some exceptions, be eaten with impunity.

1 *Tea.* 2 *Coffee.* 3 *Cacao.*

In the face of the many strictures with which tea has of late been visited, I have ventured to place it at the head of this list; and I have no hesitation in saying, that much of the odium which tea has incurred, would, with more justice, have been laid on the shoulders of the *sugar* which is taken with it, and the quantity of *warm water*, with which it is the means of deluging the stomach. My opinion of sugar has been already given freely; and it only remains that a few words be said about the warm water. Some several years since, it became somehow the *fashion* for dyspeptics to drive off the fit of indigestion by copious draughts of hot water. The practice soon told a fearful tale. In the course of months, relief was no longer afforded; the disease became worse; and, in no few instances, terminated in disorganisation, or in structural derangement, organic and incurable disease. In nearly all the cases, the fibres of the stomach were essentially weakened, and it was thrown into an almost powerless condition; from which the unhappy sufferer was

only relieved by a protracted perseverance in the exclusive use of the plainest diet, as gruel, arrow-root, and sago. I have dwelt the longer on this matter, because it may be the means of checking the practice in some who are ignorant of the consequences, and who could hardly be expected to know that a practice seemingly so simple, could be attended with risks so great; and because it will assist the reader, who is now for the first time thinking of these matters, in conceiving that the warm water, which tea is the means of introducing into the stomach, may possibly do more harm than the tea itself. Let the dyspeptic drink his tea almost *cold*, without sugar; and, if it agree with him, let him add to it half its own quantity of skimmed milk. Let him confine himself to a single teacup full, for the simple reason, that much liquid taken at the time of eating, makes the mass of ingesta, on which the stomach has to act, *too thin;* a state which prevents the contractile powers of the stomach from acting upon them readily.

Coffee is more nutritious than tea; but it is at the same time more difficult of digestion. By the healthy, or even the slightly invalided, it should be preferred, as an ingredient in the breakfast, to tea, on account of its being more

nourishing and substantial. Were it not that very few undergo sufficient exercise to render two meals a day of animal food either necessary or proper, or even safe, I should feel disposed to recommend some kind of animal food to breakfast. It is the meal at which more articles, and articles of more difficult digestion, may be eaten with safety, than at any other. Some short time since, a medical friend of mine directed my attention to the extraordinarily cordial, reviving, and *warming* effects of coffee, taken either before or after continued exposure to cold, as in travelling: and its effects in this way are certainly very considerable. Without encroaching upon another, and distinct department of this chapter, I may just allude here to the common practice of "taking a dram" of some kind of spirits before exposure to cold. It is a practice at once foolish and dangerous. The stimulating effect of the spirit soon goes off, and is followed by a degree of languor proportioned to the amount of stimulation. This is the state in which the body is most easily chilled; the secretion of the skin most easily checked; in which the person is most liable "to take cold;" and if he is exposed to the influence of cold after the stimulating effects have

subsided, the chances are very strongly in favour of his suffering from it. Spirits ought not to be taken before such exposure, unless the person is to be so exposed but for a very short time, or unless the dose is to be repeated as often as the effects of the previous dose begin to subside. Coffee does not seem to be liable to this objection; its stimulating effects are much more lasting; and its *warming* effects seem to me to be even greater, and the subsequent languor is certainly less.

There are few things, I may here remark, for which we ought, as regards health, to be more grateful to Providence, than for the introduction of tea and coffee. As civilisation advances, the man of wealth and rank uses personal exercise less, whether in walking or on horseback, and he prefers the luxurious carriage as a means of transporting himself from place to place. Keeping pace with the progress of civilisation, is the number of the thinking and the studious

* The cordial effects of coffee, the duration of the stimulus it affords was, I believe, first noticed by Dr. Rush in his "Inquiry into the Effects of Ardent Spirits." He says that he once knew a country physician who made a practice of drinking a pint of strong coffee previous to long-continued exposure to cold, and found it more cordial to him than spirits in any form.

increased; a class of men which is proverbially, and with few exceptions, sedentary. Tantamount to the increased number and importance of our commercial relations, is a larger number of men drawn from the fields, and the health-fraught toils of agriculture, into the pent-up and close atmosphere of a town, and have their time occupied in sedentary, or almost sedentary, employment. In this way there has arisen a daily increasing number of all classes, who, taking less exercise, could bear less food; could assimilate, consistently with health, a less amount of nutriment; who could not eat with impunity the meat and beer breakfasts, the heavy substantial food, to which their fathers had been accustomed; and to meet this, tea and coffee have been introduced, and supply the desideratum; a diet which is palatable, only moderately nutritious, and, if not abused, quite harmless.

Cacao, commonly pronounced cocoa, is by no means so universally easy of digestion as either tea, or coffee; but still there are dyspeptics with whom it invariably agrees. The only thing that can be done under these circumstances, is to appeal to the experience of the invalid himself. It ought to be made weak;

and, like coffee, to be taken at breakfast, rather than in the evening. But cacao, whether the bruised seed is used, or whether that made into a cake with *vanilla* or *spices*, constituting chocolate cake, is preferred, contains an oil which by no means always suits the stomach of the man in health and vigour; and still more frequently disagrees with the valetudinarian.

CONDIMENTS.

To give a tabular view of these is impossible. The habitual, or at all events the inordinate, use of any of them is improper.

Salt is the only one of which some may, and ought to be, eaten daily. But even salt is liable to abuse; and even it should be used sparingly; for the simple reason that, taken in excess, it irritates the lining membrane of the stomach, and thus deranges its functions, and the functions of its glands, producing thirst and stomach disturbance; while, on the contrary, taken in moderation, salt gratefully and gently excites these secretions, and improves the digestion, the appetite, and the health.

A too sparing use of salt is apt to be followed by acescency, indigestion, scurvy, &c. Certain

kinds of food require salt more than others, thus, more salt ought to be eaten with the fat than with the lean of meat. It should be known that the young, stout, and plethoric ought to eat less salt with their food, than the elderly, spare, and debilitated.

Vinegar ranks next in point of importance, and, perhaps, of harmlessness. There are states of even disordered stomachs, which are benefited by small quantities of vinegar. In general, however, this, and all the vegetable acids, including lemon and lime juice, do not suit the dyspeptic, and should not be used without considerable doubt, hesitation, and caution, by the invalid. Vinegar seems, however, rather to facilitate than otherwise, the digestion of food in the moderately healthy stomach; and, under *such* circumstances, it may be taken *occasionally*, without either risk or inconvenience. I say occasionally, because the fact that vinegar facilitates digestion, is no reason for its habitual use; at least is not a much stronger reason than that which is applicable to all stimuli.

Mustard and the peppers deserve to be mentioned next. I have said the *peppers* to include long pepper, the common black or white pepper, and Cayenne. These differ very little in their

effects, unless as to the degree of stimulation. They, and all stimulants, excite for a time, rousing the organs into greater activity, increasing the amount of the secretions, and augmenting the powers of the system, especially of the stomach; but languor and exhaustion are almost sure to follow even a single instance of their immoderate use; and, taken habitually, they are certain to produce, indirectly, debility, and weakened action of the several functions, particularly, and usually, in the first place, of those of the stomach. Their use should, therefore, be only moderate and occasional.

The various spices are to be looked upon in the same way, as first exciting the action of the stomach and increasing its powers, ultimately and indirectly weakening it, and impairing very materially and seriously its functions.

In the list of spices, caraway or carui seeds are deserving of especial notice, for their grateful effect on many dyspeptic stomachs, especially such as are suffering for a want of power. They seldom do harm, are often productive of much relief, and are little liable to abuse. They form a palatable and wholesome addition to the invalid's bread or biscuit, and materially facilitate its digestion.

As a general rule, it may be said that condiments (salt alone excepted) ought not to be eaten by the dyspeptic at all; and they ought to be used only occasionally and moderately even by the healthy.

Pickles are liable to the objections which are combined under the several heads, of vegetables, vinegar, and spices. They ought *never* to be eaten by a man whose powers of digestion are either weak or disordered. Such a one ought to look upon and avoid them, as he would look upon and avoid *poison.*

LIQUORS THE PRODUCTS OF FERMENTATION.

SPIRITS.

1 *Brandy.*
2 *Hollands.*
3 *Whiskey.*
4 *Rum.*

WINES.

1 *Champagne.*
2 *Sherry.*
3 *Madeira.*
4 *Port.*
5 *Claret, Burgundy, &c.*
6 *Hock and German wines.*
7 *Sweet wines generally, including all but very old home-made wines.*
8 *Ale (home-brewed).*
9 *Porter.*
10 *Ale (brewers').*
11 *Beer.*

Above are classed the stimulating products of fermentation, in the order in which I think they

are *usually* digestible *; or the wines may be thus classed according to their four principal varieties.

* But it is necessary, and only just, that, in this place, I once again say—no such rule can be without exceptions. Idiosyncrasy, or peculiarity of constitution and habit, form varieties too numerous to allow any such universal rule to be made. This man is nauseated by even the *smell* of nuts; that man is immediately covered with nettle-rash by eating anything which contains oatmeal; this man would "die of a rose in aromatic pain;" that man cannot sit at a table where onions are eaten. It is not such cases, nor cases in the slightest degree approaching to them, that tables like the above are meant to include. Although formed from a patient generalisation of long-continued and careful observation, they admit of numberless exceptions; but, conceived to apply to a considerable majority of people, I hope they may somewhat guide the choice of the invalid. It is well known that one man cannot drink any kind of spirit without suffering for doing so, but can take his bottle of wine at a sitting without inconvenience. It is well known that some men cannot drink sherry, but can drink port; some cannot drink port, but can drink sherry. The question is not whether brandy always agrees better than wine; but it is simply, does brandy generally suit the stomach, and produce less inconvenience than wine? Is sherry better borne, or more easily digested, than port? Further, these tables are formed from an observation of the dyspeptic, or disordered, or debilitated stomach, rather than from an observation of the stomach which is in a state of health. They have been drawn up with considerable care; but I am aware that, without some remarks like these, perhaps even with these, they are open to criticism. If such criticism is given with fairness and with candour, it will be received with thanks and with gratitude.

1 *Old wines, which have lost their sweetness and much of their fruitiness without acquiring acidity*	2 *Fruity wines.* 3 *Sweet wines.* 4 *Acid wines.*

Liquors, the products of fermentation, may be said to be easier of digestion in proportion to the larger quantity of spirits, and the smaller quantity of other matters which they contain; in fact, in proportion as they are *stronger* and *thinner*, destitute alike of sweetness and acidity.

Brandy is decidedly the best stimulus for the weak or disordered stomach, provided it is prevented from unduly irritating that organ by being sufficiently diluted with water. A reference to the chemical composition of brandy does not show why brandy is preferable to and more wholesome than the other kinds of spirits. The reader must be contented with the fact, although it is not accounted for. Hollands ranks next to brandy, then whisky, and then rum. The common, or English, gin, I have not mentioned, because it is a preparation of which the purity is almost always questionable, and one which, that point unascertained, should be always avoided.

Of the wines, Champagne, which is *up*, or briskly effervescent, ranks the first, on account

of the fixed air or carbonic acid which it contains. *Still* champagne would be placed somewhat lower in the scale.

Port and sherry do not differ much from each other in the relative quantity of spirit which they contain; but they differ considerably in the effects which they produce on the stomach. That which gives the colour to port and to all the red wines is astringent, and consequently, as astringents disagree generally with dyspeptics, so are port and all the red wines more likely, other things being equal, to disagree than sherry or the white wines are.

If Madeira could be obtained free from acidity, it would probably be entitled to be placed before sherry; but genuine Madeira, free from acidity, is a rarity only as a great chance to be met with in this wine-bibbing age.

The acid and the sweet wines, although deserving especial mention in a treatise on wines, hardly merit a passing word, unless one of caution, in a work like this. The debilitated should suspect, the dyspeptic should avoid them.

Home-brewed ale, clear and pale, and thin and *mild*, and not new, is, I think, preferable to porter, however good; for porter contains a large quantity of extraneous matters. The

dyspeptic, the valetudinarian, and the sedentary, ought, however, to view malt liquors with much suspicion, and more particularly in the evening, when their use is more usually indulged in. But if a man has once had warning given to him of a seriously disordered stomach; if, day after day, some slight uneasiness is experienced, if the smallest excess is followed by a slighter or more severe fit of dyspepsia, or if gouty pains have begun "to fly about," let him look to it, and make up his mind to abjure the tankard, or the bottle, or the glass, diminish his daily dose as quickly as possible, and content himself with Nature's beverage, *water*. If this cannot be thought of, or if his case is such as that it ought not to be done, let him mount higher and higher in the foregoing list, being as abstemious as resolution or necessity will let him be.

A question of some interest remains to be considered, connected with the products of fermentation. It is a question which is intimately connected with the nature of this work, and is therefore one which requires no apology nor introduction. Are, or are not fermented liquors *nutritious?* It was the opinion of Dr. Franklin that *gruel* is more nourishing than porter, or ale, or wine, or spirits, or any of the

products of fermentation. This has been the opinion of hundreds since the days of Franklin, is the opinion of hundreds now, and *to a certain extent*, the opinion is doubtless as correct in the practical results which their effect on the animal economy proves, as it is in the theoretical conclusions to which chemical analysis would, *à priori*, lead us. But, let me say, first, that chemical analysis is, apart from practical demonstration, no proof of the degree of nutriment which any substance is capable of affording. Dr. Prout analysed starch, gum, sugar, and the essential principle of wood, lignin. He found them to differ not at all in the nature of the elements which form them, and very little in the proportion in which those elements combine. And as a proof that the slight difference of proportion in which the elements are combined would furnish no clue to their relative power of affording nourishment, beginning at one end of the list *, gum ought to be more digestible than starch, or sugar, or wood; beginning at the other end, wood ought to be more nutritious

* Gum, 36. 3 per cent. Carbon. 63. 7 Water.
Starch, 36. 4 do. do. 63. 6 do.
Sugar, 41. 5 do. do. 58. 5 do.
Lignin, 42. 7 do. do. 57. 3 do.

than any of the other three, neither of which is correct; for we know that sugar is much more nourishing than any of the others. Therefore chemical analysis is no more a proof that this substance is more or less nourishing than that substance, than it is a proof that this vegetable is poisonous and that wholesome, which it is assuredly not, seeing that the poison and the wholesome food, the tonic and the aperient, often hardly differ in elementary constitution. So much for the *chemical* part of the argument, that fermented liquors are not nourishing in greater proportion than the foreign or mucilaginous matters which they may contain. My own opinion is, that they are something more than mere stimulants, and that they, at least some of them, as ale, porter, and port-wine, nourish to an extent which no chemical theory can either trace or keep pace with. But this having been granted, it must at the same time be allowed that the chief use of all or any of the products of fermentation is to rouse the circulation into more energetic action, to increase the power of the absorbents, to enable, indeed to compel them, to do more work, to take up more nourishment from the food, to force vessels, debilitated from whatever cause, or depressed by

whatever influence, to pour forth more of those secretions which are necessary for the conversion of food into chyme; to urge those vessels to increased exertions which absorb the nutriment or chyle from the chymous mass and convey the chyle to the blood; to stimulate the heart's action, and cause the blood to flow quicker through the vessels, carrying with it at once the nutriment or new material to be deposited in every tissue and every fibre, and the stimulus to *enforce* its conversion into texture. This is the use of wine and spirits in convalescence and debility.

It is a distinguishing peculiarity of chemistry to be for ever discovering things which it cannot explain. The fact to which I am about to advert is an instance of this. It has frequently been noticed before *, but it may probably not be known to the reader. The proportion of spirit or alcohol in brandy is, on an average, rather more than fifty-three per cent. †, in port-wine rather more than twenty-two per cent., consequently *every bottle* of port-wine may be said to contain more than a *fifth* part of *pure spirit*,

* See Dr. Paris on Diet, p. 199.

† Brande's Chemistry, vol. ii. p. 567.

or twice that quantity of brandy, as the spirit is twice the strength of the brandy. In a bottle, then, containing twenty ounces of port wine, there are more than four ounces of pure spirit, or more than eight ounces of spirit as strong as brandy. Every man knows that the effects upon his system of a bottle of port-wine, and those which more than half a pint of brandy would cause, are essentially different. How it is that spirit, taken in the compound form of wine, is so much more inert than when taken simply diluted with water, we cannot tell. Chemistry tells us that it is so, but does not tell us *why*.

The individual articles of diet have now been discussed. Several general observations will be found to be interspersed among them. Many still remain to be mentioned.

Eating at regular hours is one of the first as well as most important of dietetic regulations; one which the man in comparative health would do well to attend to; one the necessity of which cannot be too strongly impressed on the invalid. The interval between the meals ought not to be longer than *five*, nor less, as a general rule, than *four* hours. For instance, if the first meal is taken at eight o'clock in the morning, the second ought to be taken at

one, P.M., the third at six, P.M., and the fourth, *if a fourth is taken at all*, between nine and ten at night. It will be observed, that five hours is here allowed after breakfast, and the same after dinner; only three hours and a-half after tea. The reason is that the two former are the principal meals, and ought to be looked upon as almost the only *meals*. Tea is merely a cordial to the stomach, often grateful, at times, if the stomach is languid, even necessary; but if very little or no solid food is taken with it, tea rather revives and comforts the stomach after its labours than burdens it with a greater quantity of work.

Another remark is founded on the preceding. It is not only impolitic, but almost always directly injurious, to eat between the meals. The reason is obvious. Food seldom leaves the stomach in shorter time than *three hours*, and more usually, especially if the powers of the stomach are at all languid, remains in it between *four* and *five* hours: some kinds of food, as a matter of course, remaining in it much longer than others. An interesting case which fell under the observation of Dr. Beaumont of Plattsburgh in the United States, and which he

has recorded in a work recently published *, I shall mention, because it illustrates some of these remarks. It is the case of a young man who was wounded by a musket shot. The shot entered his body from behind and came out at the left side, below where the heart may be felt beating, blowing off skin and flesh of the size of a man's hand. The case need not be particularised here. Suffice it to say that the stomach was lacerated, and a large aperture made in it opposite the wound; that the young man recovered, all the injured parts resuming their natural condition, but this aperture still remaining; that after some time, nearly two years, a small fold or doubling of the coats of the stomach formed at the upper margin of the opening, and gradually covered it like a valve, preventing the contents of the stomach from escaping, but being easily depressed by the finger, and then what happened to be in the stomach readily flowed out. With this facility for inspecting the process of digestion in a

* Experiments and Observations on the Gastric Juice, and the Physiology of Digestion. By William Beaumont M.D.

See a recent number of the Medico Chirurgical Review.

young man who was quite healthy, for he had completely recovered his health and powers, Dr. Beaumont came to several interesting and practical conclusions. I shall perhaps have occasion more than once to make use of them. He was enabled, by a little manipulation, to extract from the stomach the gastric juice, and he found that, if kept at the natural temperature of the stomach, (100°), it readily dissolved various alimentary articles.

Sago and tapioca in 3 h. and 15 m.; fresh wheat bread in 4 h. 30 m.; oysters, raw and entire, in 7 h. 30 m.; stewed, in 8 h. 25 m; beef steak in 8 h.; boiled beef in 9 h. 30 m.; cream in 25 h. 30 m.; olive oil in 60 h.; boiled cabbage in 20 h.

I shall add to the above only this: the contractile powers of the stomach did not act in these cases, nor does it appear that the food was in all cases masticated and mixed with saliva previous to putting it into the gastric juice; and therefore the times above stated as those which the solution of the several articles occupied, must be considered to be longer than their *digestion* in the stomach would occupy.

A third important fact is, that the more

thoroughly the food is masticated the quicker and more easily is it digested.

The gastric fluids are only poured out when food or some other stimulus comes into *contact* with the lining membrane of the stomach. Consequently an empty stomach is not, as used to be supposed, necessarily productive of injury; and the old, but (alas!) still much used adage, "eat little and often," is as absurd in theory as it has long been found to be injurious in practice.

Food ought not to be eaten *quickly*. It is important, as has been already observed, that each morsel of food should be thoroughly masticated; but it is likewise important to eat slowly because there is then less danger of eating to repletion, of taking more food at any one time than the stomach can easily digest. If food is eaten slowly a distinct sensation is felt when enough has been taken. If food is eaten faster, this sensation is either not perceived until too much has been taken, or it is not attended to. To use the language of Dr. Wilson Phillip, "The dyspeptic ought to attend to the first feeling of satiety; there is a moment when the relish given by the appetite ceases: a single

mouth-full after this, oppresses a weak stomach. If he eats slowly, and carefully attend to this feeling, he will never overload his stomach."

During the first stages of the digestive process, a large quantity of blood is directed to the stomach, to produce the secretion of the gastric juice, and supply its muscular fibres with contractile energy. If the stomach is at all debilitated, or disordered, it is important that no diversion of this large quantity of blood should be caused; a diversion which is, and must invariably be produced, by throwing any of the muscles into action; or by setting the mind to work on any engrossing and thought-requiring subject. It is important then that the invalid and dyspeptic should remain quiet and still for some time after he has concluded his meal; that is during the first stage of the digestive process; in fact while the gastric juice is being secreted, and being mixed with the food. The time necessary to be so spent in non-interference with the stomach's energies varies according to the degree of aggravation, according to the severity of the case; usually from half an hour to two hours. After this it is well to exercise the limbs and the trunk; doing so assists the

other stages of digestion. The mode in which it does so will be mentioned elsewhere.

A rule of much importance, for which we are indebted to Dr. Paris, is, "that the valetudinarian and the dyspeptic ought never to take the principal meal in a state of *fatigue*." The stomach requires, as has been already said, all the energies of the circulatory system during digestion; and if those energies have been weakened by any cause, the probability is that the digestive process will be more or less disturbed; disturbed in proportion to the weakness of the system, or the kind and degree of the dyspepsia.

If the dyspeptic eats solid food, the less liquid he takes with it, the more easily will it in general be digested. This rule we owe to the late eccentric but eminent Mr. Abernethy. Liquids ought to be taken between the meals rather than at them. A man ought rather to drink before eating, than either while eating or soon thereafter. It would at one time have been said to be injudicious to drink before eating; because such a practice might dilute and consequently weaken the powers of the gastric juice. This is now known to be a false objection; because the gastric juice is, in

reality, not secreted unless aliment is in contact with the lining membrane of the stomach.

The stomach, after a night's rest, is completely empty of food; its powers, with those of the whole body, are refreshed and invigorated by sleep; the gastric juice is then secreted more freely, and that is therefore the time when the stomach can, with most ease, perform its functions. The breakfast is the meal at which all men should eat most heartily. It, and not the dinner, ought to be the principal meal.

Every sufferer from indigestion ought to confine himself to *one*, or at most *two* dishes. A multiplicity of dishes tempts the appetite to overload the stomach; and it would likewise seem that the stomach digests quicker a single dish, even of somewhat difficult digestion, than a mixture of dishes which are digested more easily. *Made dishes*, dishes composed of a great variety of articles, are included under this head. The simpler the dish to which the dyspeptic confines himself, the less likely is he to *feel* its digestion.

The last matter that I shall mention is, attention to the *quantity* that is eaten. I mention it last, not because it is least important, but on the contrary, because it is the *key-stone* of the

whole dietetic arch we have been rearing. All that need be said on this subject, is contained in the following quotation from one of the papers of the great and good Dr. Fothergill.

"Nothing is of so much consequence to invalids, and the more delicate of both sexes, as attention to quantity. There are many people who seem to be possessed of such powers of digestion, as to be under no restraint on that account, and who never feel themselves incommoded, either with quantity, or the most heterogenuous qualities of their food. They rise from the most plentiful mixed and rich repasts, without any kind of apparent uneasiness. But this is not the case with the generality—they are affected with uneasiness, some in one way, some another, by the unnatural load. And how often do we hear such complaining of the ill effects of this or that particular kind of diet, when, perhaps, their sufferings arise from the quantity of all rather than the disagreement of any.

"It demands attention to observe that just medium, and no less resolution to keep to it, which the stomach invariably points out in respect to quantity. The *how much* must be determined by every individual."

I shall conclude this chapter with a few generalisations of the foregoing remarks.

The man in health can scarcely be looked upon as likely to read this work. Should there however be such a one among its readers, and if he is not one who laughs at doctors and physic, let him listen to a little friendly advice with regard to his diet. Let him measure the amount of food which he takes by the amount of bodily exercise which he undergoes. Let him eat at regular times; never fasting, unless at night, longer than five hours. Let him make breakfast his principal meal. Let him avoid as much as possible all kinds of drink but water *. Let him drink as little as possible, either while eating, or soon after his meals. Let him eat his food slowly, masticate each mouthful thoroughly, mixing it intimately with the saliva. Let him sit at least half an hour after each meal. Let

* "Tho' I look old, yet I am strong and lusty;
For in my youth I never did apply
Hot and rebellious liquors in my blood,
Nor did I with unbashful forehead woo
The means of weakness and debility;
Therefore my age is as a lusty winter,
Frosty, but kindly."

"As you Like It," Act ii. Scene 3.

him dine invariably on one or at most two dishes. Let him content himself with little or no supper. By attending to these rules he will, as far as diet goes, fulfil his duty to his health; he will be taking the best means of warding off disease.

To the dyspeptic this same language must be used; but it must be increased in severity. Let him watch narrowly the effect of every article that he eats on his stomach. Let him *never* eat of more than *one* dish, and that must be a dish which agrees with his stomach; even if, in order to get one which digests without inconvenience, he should be obliged to abjure meat, poultry, fish and game, and content himself with *gruel.* Having once reached that point in the scale of comparative digestibility, at which the food agrees with him, let him keep to that point; until by that, and the measures of regimen to be pointed out in the subsequent chapters of this work, his stomach have fortunately regained its tone, and powers, and quietude, and then let his steps be retraced with caution; stopping short, as his own common sense will direct him, of that point, at which his stomach first showed signs of disturbance.

CHAPTER II.

" The first physicians by debauch were made;
Excess began, and sloth sustains the trade.
By chace our long-liv'd fathers earn'd their food;
Toil strung the nerves and purified the blood;
But we, their sons, a pamper'd race of men,
Are dwindled down to threescore years and ten.
Better to sweat in fields for health unbought,
Than fee the doctor for a nauseous draught.
The wise for cure on exercise depend,
God never made his work for man to mend."

DRYDEN.

" As I am a compound of soul and body, I consider myself as obliged to a double scheme of duties; and think I have not fulfilled the business of the day when I do not thus employ the one in labour and exercise, as well as the other in study and contemplation."—SPECTATOR, No. 115.

THAT bodily exercise is useful and necessary to health is a fact which experience teaches, which every man knows. Why it is so physiology explains, the anatomy of the human frame demonstrates.

EXERCISE IS SERVICEABLE—in strengthening the system, adding power to every fibre, and giving increased energy to every vessel:—in promoting the secretion of the fluids, which are necessary for the chymefaction of the ingesta; in promoting the separation of the nutriment, or chyle, from the chymous mass; in promoting the secretion of bile, which, *the natural* purgative, is required to carry the residuary or excrementitious matter through the intestines; in promoting the secretion of mucus from the lining membrane of the bowels, which prevents the mass of foreign matters in them from unduly irritating their susceptible tissue; in promoting the passage of the chyle through the vessels (the lacteals and thoracic duct) which carry it into the blood; in quickening the circulation of the blood, and therefore the respiration, and, thereby, increasing the amount of the secretions and excretions, and so relieving the system from foreign matters which, if retained, might be hurtful to it; in promoting the absorption of old structures and the deposition of new structures in their place. All this, exercise is able to do, aye, and more than this, for by thus promoting excretion, and particularly that of the skin, the nervous system is freed from any

thing like a loaded condition; by these means the circulation of the blood is *equalised*, partial distributions of it, local congestions, prevented; and, by the increased rapidity with which the blood is made to flow through the vessels of the brain, without any approach to an undue gorging of those vessels,—from the marvellous, and to us inexplicable sympathy which subsists between the mind and the body,—exercise quickens the mental faculties, rouses the mind's energies, disperses gloom and despondency, paints on the mental retina the world and its affairs in all the glowing and bright colours of cheerfulness, throws its cares into a distant and misty back-ground, while its pleasures and its joys are advanced to the fore-ground of the picture, and the bright green spots of by-gone happiness are placed vividly in their native sunniness before the mind; and fairy scenes of imaginative hope lend to the future a brightness, and impart to the mind a delight, which the absolute realisation of every such hope could not go beyond, and in all human probability would never equal.

And nature enables exercise to accomplish all this, to effect so much, by the simplest contrivance. The vessels are provided with *valves;* particularly those which carry fluids in a direc-

tion opposite to that of gravity. The consequence is that any external pressure on these vessels assists in propelling their contents forwards; the valves preventing their retrogression. Now the vessels which absorb the chyle from the digesting mass are each, at short distances, furnished with these valves. Every motion of the trunk, every flexure of the body, every inspiration in which the abdominal muscles are called into active play, must drive the chyle faster through them, and cause it the sooner to enter the blood. And then it is whirled on to the heart, thence to the lungs, and through the system; not at the ordinary rate of speed, at which it would move were the man at rest; for the veins, or vessels, which bring the blood from the system back again to the heart, are likewise furnished with these valves; and, thus, the contraction of each muscle in moving the arms and legs, and in supporting and bending the trunk, all drive the blood on through these vessels; and carried quicker to the heart, that organ is roused into quicker contractions; and the blood being driven more rapidly through the lungs, renders a more full and more frequent supply of air necessary to arterialise it, and consequently the respirations become deeper and

quicker; carried back from the lungs to the heart with this increasing velocity, it is driven more rapidly through the system; and its organs of secretion and excretion, obedient to the increased impulse, to the quicker supply of blood, pour forth more quickly and in greater quantity the several products which it is their destination to form from the blood; whether directly excrementitious, and therefore at once to be discharged; or ordained, in the first place to fulfil some office in the economy, as the mixing with, or the solution of the food, or the extraction of nourishment from it; or to lubricate the membranes, moisten the tendons, &c.; or to form *new* textures, *new* tissues, *new* organs, and to make up for the wear and tear which every part is each moment undergoing.

So much for a Physiological theory of the mode in which exercise is able to exert so much influence over the system; an influence so great that, other things being equal, and within certain bounds, a man will be stronger, in the enjoyment of better health in direct proportion to the amount of exercise which he takes.

But the exercise must not be confined to the movement of any set or series of muscles; but,

as far as possible, all the moving powers of the body ought to be brought into play: and the more completely each muscle is contracted, and the greater number of them that are used, the more beneficial will the exercise be.

The practical deductions from this remark are many. Equitation, or riding on horseback, is better than gestation, or being drawn in a carriage. Walking is better than equitation; quick walking than slow, running than either. A combination of several of these, as each has its favourite sets of muscles, which it uses most, is better than any one by itself.

Exercise of the arms is next in importance to that of the legs; and consequently some simple gymnastics, such as raising the body from the ground by grasping a suspended cord or a transverse pole with the hands; or even swinging the arms round, or thrusting them backwards and forwards*, is an excellent assistant to walking, or

* Dumb bells, of a weight proportioned to the strength, are admirable auxiliaries. Hindostanee clubs, which are made of wood, about twenty-five inches long, three inches and a half in diameter at one end, about one inch and a half at the other, the broad end being loaded with lead, are, I think, better as an exercise for the arms than dumb bells. Those from which I have taken the above measurement weigh four pounds and three quarters each. The weight of lead with which they should be loaded should vary according to the

running; one which most men of sedentary habits ought to have recourse to as a means of warding off disease.

The *skipping rope*, a toy which is discarded by the young girl when entering a premature womanhood, but which ought to be looked upon as a necessary article in every boudoir, or private room occupied by a woman of civilised life and civilised habits, is one of the best, if not the very best kind of gymnastic exercise that I

strength of the user. He might begin with clubs weighing two pounds each. He will soon find, however, that his clubs get too light for him, he gathers strength, and more lead must be put in. The exercise is — to stand perfectly erect, the feet close together, the shoulders thrown back, and with a club in each hand, to swing the clubs alternately round the back of the head, from fifty to one hundred times. This should be repeated three or four times a day. The late Sir John Malcolm was in the habit of daily using these clubs, during his passage from this country to India, and he always expressed himself to derive considerable advantage from the exercise. One of the officers on board, to whom indeed I am indebted for all I know about these clubs, and who, now in civil life, daily uses them, tells me that the clubs used by Sir John Malcolm were not loaded with lead; but were made of a very heavy wood. Sir John Malcolm afforded one of the most striking examples of the advantage to be derived from exercise that has perhaps ever been noticed. He used to go on deck early every morning, and amuse the seamen by kicking his legs about, and by all kinds of muscular movements. Sir John was strong and hale, his health but little affected by change of climate.

know. It exercises almost every muscle in the body.

There are few women who do not neglect exercise. Men, most of whom have some necessary out of door occupation; men almost universally walk more than women. Thousands upon thousands of Englishmen never cross the threshold of their houses oftener than once a week, and then it is to attend the public worship of their Maker, and it is seldom that, in towns, the distance to the church or the chapel is such as to occupy more than ten minutes in going thither. And what is the consequence of this? Pallid skins, blanched lips, sunken eyes, premature grey hairs;—daily exercise is, depend on it, worth all the Macassar Oil in the world *;—

* This simple fact has been rarely, if at all, noticed. Yet the sedentary, the studious, the debilitated, and the sickly are, with very few exceptions, those who are earliest visited with grey-hairs. The agricultural labourer, the seaman; all whose employment consists of or involves exercise in the open air, and whose diet is as necessarily simple, are those whose hairs latest afford signs that the last process has commenced, that the fluids have begun to be absorbed, the textures to dry up and become withered. All whose employment renders much sitting necessary, and little or no exercise possible; all who study much; all who, from whatever cause, have local determinations of blood, particularly if towards the head, are the persons most liable to carry grey hairs. It is well known that mental emotions, violent

the consequence is debilitated constitution, functional derangement; the consequence is, that state of system which predisposes to organic disease, to structural disorder, which is most favourable to the development of consumption, disease of the heart, &c.; the consequence is, disordered condition of the uterine functions, and either barrenness, or frequent abortions; and if not one of those, the consequence is, perhaps, even a still stronger appeal to the best feelings of the mother's heart; the consequence is a sickly offspring, which will either be early freed from the misery of a weakly delicate existence, or, with difficulty reared, will carry

passions have in a single night made the hair grey. Instances of this are numerous. They are in the same way to be understood and explained. They are owing to the increased determination of blood, stimulating the absorbents into preternatural activity, and causing them to take up the colouring matter of the hair. It will indeed be fortunate if a desire to preserve the youthful luxuriance of her hair, should induce any fair votary of fashion and civilisation to forego late hours and heated rooms, and to try whether it is not better, and productive of more happiness, as well as calculated to produce this end, to exercise her limbs and inhale the fresh and untainted breath of the morning hours; it will indeed be fortunate if this, or any thing else, induce any fair victim of civilisation, who earns her bread by ministering to the gay pleasures of her wealthier peers, to steal from her labours one single hour, as an offering to her health.

the mischief through unborn generations, by producing in its turn an offspring, with debility for its inheritance *.

* The extent to which diseases are hereditary, constitutes a fearful subject of inquiry; one which lays a vast load of responsibility on parents. Let a man inherit ever so good a constitution; let his family be ever so healthy, or robust; if by debauchery he debilitates his system and taints his blood; if by excess he produces disease; if by sedentary habits he weakens and enervates his system; and if he does this prior to the birth of any child, that child will assuredly, to a greater or less extent, be visited for his father's errors, with a predisposition to that father's diseases. If a woman by similar excess, or by errors in dress, &c., injure her constitution before she become a mother, her children will to a greater or less degree inherit her infirmities. Diseases are hereditary; only to be warded off by a careful avoidance of the errors of our parents: we are only to be prevented from adding to the number of these family encumbrances, by simplicity of life and regularity of conduct.

"In this way parents often live after death in their offspring. Of a certainty children are like their parents, not only as to features and the form of their bodies; but as to the disposition, as to the virtues and vices of their minds. The imperious Claudian family long flourished in Rome: a family which produced the tearless Tiberius, the most fearful of tyrants: a family which gave birth to the *inhuman* Caligula, and to Claudius; and, after a lapse of six hundred years, to Nero."—*Translated from Gregory's Conspectus.*

That Horace knew this will be evident to the classical scholar from the following passage:—

"Fortes creantur fortibus et bonis:
Est in juvencis, est in equis patrum
Virtus: nec imbellem feroces,
Progenerant aquilæ columbam."

Carminum, Lib. iv. Od. 4.

Let fathers and mothers look to this. It is not enough that you find your children in food, and clothing, and the comforts of life. It is not enough that you provide them with the means of mental enlightenment. You have not done your duty, unless you have fortified their health, by making them exercise their limbs at least one or two hours every day; unless you give them the *habit* of *working* for their health,—for whatever be your rank, or wealth, this you cannot do; you cannot separate from each other health and bodily exercise. They are necessary to each others' well-being. And by exercise is here meant, not the mere quiet and partial muscular movements which the act of walking requires;—although this is not to be neglected, inasmuch as change of air, exposure to the direct rays of the sun, and to an unbreathed and undeteriorated atmosphere is necessary;—but, in addition to this, exercise of the arms and legs by using dumb-bells, or the skipping rope, or by simple gymnastics, or by *dancing*.

Dancing is, I think, an invaluable *school-room* recreation. I would have every child learn dancing. It gives freedom to the limbs, firmness to the step, grace and equality to the

carriage; it is moreover a kind of exercise in which the action of a great number of muscles is combined; and it is a kind of exercise which enlivens the mind while it invigorates the body. Let people think as they will of public balls, or even of private balls,—with the conscientious opinions of others, it is neither my wish, nor my intention to interfere,—but to dancing in the nursery, or the school-room; to dancing among the members of a family circle; I have never yet known any man of common sense express any objection. And one thing may be depended on. Were dancing thus made general, made a daily —*not nightly*—exercise, our people would become longer lived and healthier; and on the principle that health of body and enjoyment of life are nearly closely allied, we, as a nation, should be happier; and on the principle that health is necessary to a *continuance* of intellectual labours, we, as a nation, should be wiser and more thinking.

The importance of exercising all the muscles of the body cannot be too much, or too strongly insisted on. Workmen at laborious trades are generally unhealthy. This must of course in great part be attributed to the tainted, impure atmosphere which they are doomed to breathe;

but there is no doubt that much of it is owing to the muscles being only partially exercised. In most trades the arms alone are used and the legs are not at all exercised. The labour may be fatiguing, but the exercise does not call muscles enough into action; and even, although a man may have to wield a hammer weighing twenty or thirty pounds several hours every day, that will probably not prove sufficient. Let him use such exercise as shall call his lower limbs into action if he values his health; and as a matter of course, in order to correct the influence of the impure, mephitic, or confined air of the work-shop, let him take such exercise in the open air.

One other remark may here be made; namely, that exercise does most good, if the situation in which it is taken is elevated; if the air is dry, and rather cold than warm. There are, of course, individual peculiarities to act as exceptions to these, as to every general rule. Some cannot breathe the air of an elevated situation without difficulty, and a sense of uneasiness in the chest. Some cases require the air to be warm as well as dry, as the consumptive.

The degree of exercise must necessarily be regulated by the age, and constitution, and condition of the individual.

Of all *kinds* of exercise, walking is that which is the most universally attainable, and the best.

The invalid just arisen from the bed of sickness, is usually re-introduced into the open air by carriage exercise. This is not improper if the carriage is a close one; but if it is a gig, or other open vehicle, it is almost invariably to be condemned. The action of the heart and blood-vessels being enfeebled by disease, the blood is driven languidly through the system; and a quick succession of applications of cold air to the surface of the body, easily checks the circulation of the blood through the vessels of the skin; the perspiration is thus checked, the internal organs are loaded with blood, and a relapse into disease is the frequent result. The rapidity with which the air surrounding the body is changed, contributes to this effect. The air immediately surrounding the body getting warm, if the individual is stationary, protects him somewhat from the colder air which is exterior to it. The less frequently this outer garment is changed, the less heat is taken from the body *.

* This depends on one of the best known of the laws of chemistry. If a wet cloth is hung in dry air, the more dry the air, the quicker will the cloth lose its moisture by evaporation. If a ball, heated, say to 600 degrees, is exposed to the cooling influence of air at the temperature of 60°, it

Again, in gestation, there being comparatively little exercise of the muscles, that assistance to the circulation which the muscular contraction has been described as affording is not given. Whereas in walking, or in any kind of exercise, no matter how gentle or how slow, aid is afforded to the weak and languidly acting heart and blood-vessels, and risk from the chilling and depressing influence of the cold proportionably lessened. So firmly impressed am I with the importance of attention to this, that, if the strength is at all equal to it, I always advise my patients, when going out for the first four or five times after an illness, to prefer gentle walking, even if only a few yards, to any kind of less active exercise. Indeed if the patient cannot walk out, and if

will at first cool very rapidly; but the nearer its temperature approaches to that of the air which surrounds it, the slower will it lose its heat. Its temperature will very rapidly fall from 600° to 300°, less rapidly from 300° to 150; and every succeeding degree its rate of cooling will be still slower and slower. The more quickly the air around it is changed,—in other words, the colder the air which surrounds it, the greater difference that there is between its temperature and that of the air, the quicker does it cool. The drier the air around a wet substance, the quicker will that substance lose its moisture; the damper the air, the less readily does it acquire or imbibe more moisture, and the slower will the substance dry. This is the "*Philosophy of Fanning*"—to ape the custom of using grandiloquent words on common subjects.

the inability to do so is only the effect of general debility, it may well be a matter for thought and doubt as to the propriety of exposing the surface of the body to the open air at all. I may just mention here, although the remark would be better placed in a subsequent chapter, that in cases of so great debility, I have usually found advantage in beginning with frictions, as with a flesh-brush; at first gentle, and only used for a short time, then used more vigorously and for a longer period; following this, after it has been persevered in for a longer or shorter time, according to the nature of the case, by sponging the surface with warm water, and continuing the friction: afterwards, gradually lowering the temperature of the water, and increasing the degree of the friction. In this way and by these means, in a time often very short, and to a degree almost incredible, and if prudently managed, with scarcely any risk, the patient has recovered strength, and been enabled to walk unassisted, and prepared for exposure to the natural temperature of the air.

From what has now been said, another observation might be inferred; yet, perhaps a mention of it may not be quite superfluous. The convalescent should never stand still when

out of doors taking his exercise; it is a rule which every man just recovered from disease, on first committing his system to the rude embraces of the open air, ought to bear constantly in mind — he ought always to keep moving. I have known many a distressing case of relapse into disease produced by the kind sympathy of friends meeting an invalid, and stopping to congratulate him on his recovery, or to inquire after his health. Let me hope that this may be a lesson to both parties:—to the invalid, to prefer his health, perhaps his life, to the ordinary, and, in their place, proper etiquettes of society; to the friend, to defer his attentions until, at all events, they cannot do harm.

I have said that the degree of exercise must, of course, vary with the age, condition, and habits of the individual; but the degree of exercise which is usually serviceable is, I am satisfied, so generally underrated, that I will, as far as I can, enter into particulars.

Two miles a day is the *minimum*—the smallest distance which a person of moderate health and strength ought to walk. If the powers increase, or are stronger to begin with, the *minimum* ought to be four miles. The object

should be to walk four miles in an hour; and the invalid, beginning perhaps by walking a mile, or a mile and a half in an hour, should *gradually* increase his rate of walking until he has accomplished this end.

Quick walking calls more muscles into action than slow walking does, and is therefore better. The muscles of the back and trunk, neck and arms, are very little used in slow walking. A person can hardly walk quickly without using them to a considerable degree. It is a maxim which I cannot too often repeat—the more muscles are used, the more advantageous will be the exercise.

I am averse to saying much on the other kinds of exercise, as equitation, gestation, or sailing, because I am aware that the majority of people think too much of them, and too little of walking,

Equitation is however an admirable assistant to walking; one which exhilarates and enlivens the mind; one which, by carrying the body rapidly through the air, if the system is moderately strong, strengthens and gives tone to the surface; for that degree of cold which does not depress the powers, or check the circulation of the skin, acts almost always as a *tonic*. It

moreover calls other muscles into action, and is, therefore, a very valuable auxiliary to walking.

Carriage-exercise is of a much more *passive* nature, and, indeed, is rather to be esteemed as a means of breathing fresh and open air, and as a means of enjoying change of air, than as an exercise. The roads are now so smooth and level, and carriages are hung on springs so perfect, that the degree of exercise which gestation involves is very trifling; it is, at all events, so little, that however serviceable a ride in a carriage may be, as a means of breathing a fresh and a different atmosphere, it should not be relied on as an exercise.

Sailing has long been lauded as an admirable remedy in many, and especially in pulmonary complaints; and its good effects have been attributed chiefly to the motion of the vessel. I have come, *nolens volens*, to a different conclusion. The air far out at sea is excessively pure; the temperature remarkably equable; the excitement very great by the novelty of every thing around the invalid; the bustle, the activity, the life, the hilarity, the gay and reckless cheerfulness of everything and every one he sees; the necessarily regular hours for the meals; the early going to bed; the separation from de-

sponding friends, from the cares of life; the escape from a heated room and a mephitic atmosphere; the consequences of a complete getting rid of all congestive disturbance by the sea-sickness; and the extraordinary and, I think, unexplained vigour with which the absorbents act; all conjoined are more than enough to explain every, however great, change for the better in the invalid's health, without having recourse to the motion of the vessel as a mode of accounting for it.

There is, however, one kind of exercise that has not often been mentioned, nor even been thought of as *an exercise;* that of the lungs and the muscles of the chest and wind-pipe in speaking, singing, reading aloud, &c. It has, however, been mentioned often enough to prevent any claims to originality of ideas upon it, however new it may be to the reader to find it looked upon as an element of health.

One of the greatest, if not the greatest thing to be attended to in every kind of exercise, is to proportion it to the strength and the constitution of individuals. So proportioned, the exercise of the voice is no mean auxiliary to exercise of the other muscles of the body, and is a remarkable means of giving additional strength to the respiratory organs, and of diminishing the risk

of pulmonary diseases. So important and so great is its influence, that it would be well if it were made a prominent feature in the physical education of youth. It would be well were children encouraged in their vocal ebullitions of boisterous merriment, instead of being, as they often are, awed, or chidden, or even beaten into silence. It would also be well if they were early exercised in the great art of reading aloud, not merely to the extent at present practised in our schools, but were it made to form a part of their evening employment: the subjects chosen might be light and amusing, and so the idea of its being a hardship, or a task, be completely obviated. Were they in their days of childhood allowed to laugh, shout, &c., at proper times, without restraint or correction; were they in their days of girlhood and boyhood made to read aloud for half an hour, more or less, according to their strength, every morning and evening; the delicate tissue of their lungs would acquire a firmness, the respiration a freedom, and the voice a capacity, and its intonations a variety, which would be at once a great means of averting the pulmonary complaints, that are so fearfully rife from the age of puberty upwards, and would be a direct means of giving to our youth that most difficult of all acquirements, a

sponding friends, from the cares of life; the escape from a heated room and a mephitic atmosphere; the consequences of a complete getting rid of all congestive disturbance by the sea-sickness; and the extraordinary and, I think, unexplained vigour with which the absorbents act; all conjoined are more than enough to explain every, however great, change for the better in the invalid's health, without having recourse to the motion of the vessel as a mode of accounting for it.

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the principle in the physical education of the children they have the charge of.

And this leads me to say a few words on the common practice of putting a flute, or other wind instrument, into the hands of boys. As a general rule, the practice is injudicious; and it is the more injudicious in proportion to the original, the congenital delicacy of the boy's constitution; in proportion to the impurity of the air he has breathed for the greater part of his life; in proportion to the late hours at which he has gone to bed; in proportion to the excess of stimulants and luxuries that have been mixed with his food, or the deficient nutriment that his food has contained. Every thing in short that has had, directly or indirectly, the effect of relaxing or weakening the powers of his body, is a direct reason for not allowing him to exercise his lungs to any unusual extent, or in any unusual way; and to such the use of wind instruments should not be permitted. The time, and the earliest time when such should begin to use them, is when the chest is fully formed—when the body has attained its full growth, and its fibres and its tissues have acquired the firmness of perfect manhood. It may seem superfluous to say, that the more the lungs have been actively exercised in early life, the less, *cæteris paribus*, will be

mastery over the voice, its tones, and its intensity. In the later years of girlhood or boyhood, say from twelve years old upwards, prepared for it by such previous exercise, the lungs might with propriety be still further used in singing, &c.; while without such preparation, this severer exercise of the respiratory organs is but too often followed by shortness of breathing, by other marks of pulmonary derangement, and, too frequently, these are only the harbingers of genuine and incurable consumption. The fact is, that, accustomed to speak low as children, but little used to reading aloud as girls and boys, the lungs are then often for the first time actively exercised, and the result is irritation and consequent inflammation of their substance or their membranes, the development of *latent tubercles*, and the fearful sequelæ, consumption and death.

Were it the case that every single subject in this work should fill a space equal to its importance, this should occupy the whole, or nearly the whole of its pages. It is hoped, however, that any father or mother, or school-master or school-mistress, who may happen to look over this work, will think well on the subject, and receive it as a practical remark, the result of practical and real observation, and follow out

the principle in the physical education of the children they have the charge of.

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then had. Such will skip or play at battledore and shuttlecock, or enter with heart and soul into a game at "catch me who can." Need it be said how important, and indeed needful, is an attention to this matter, in advising exercise to others, or in selecting a kind of exercise for ourselves.

The *age* of the individual renders discrimination and modification necessary. It would seldom be wise to recommend the same kind of exercise to the elderly father or mother of a family, that might with propriety be advised for his or her children or grand-children; the exercise must be more quiet, and at the same time more grave and dignified, other things being equal, as the individual is older. The muscles cannot, in advanced life, be exercised so much, or so long as they could at an earlier period; the organs cannot so well bear, as they could have done in former years, the sudden and large influx of blood that violent exercise necessarily causes. The walls of the blood-vessels are harder, while their power of contracting upon their contents is materially diminished; there is, therefore, greater risk of inducing congestions of blood, or even hæmorrhage, than there is in younger people: any kind of violent, or even very active exercise is

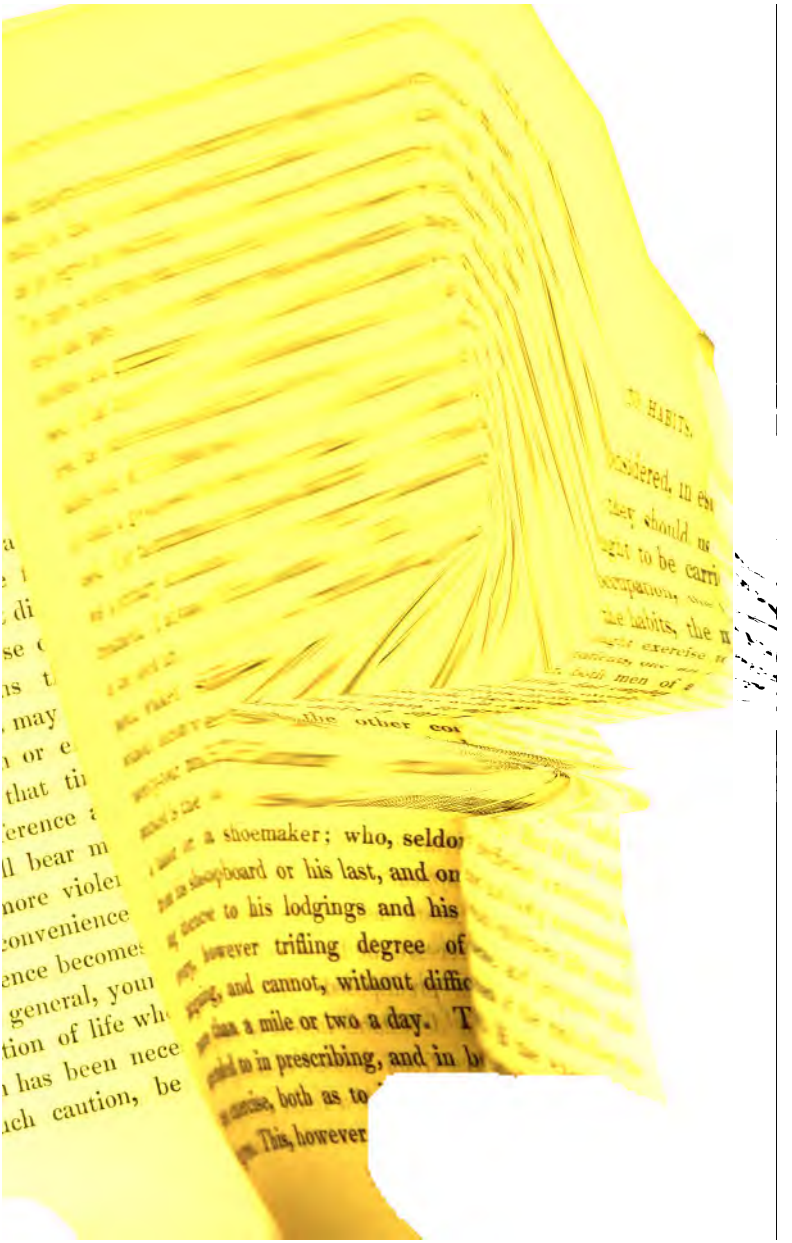
highly improper and dangerous, under such circumstances. The boy or the girl may run, jump, leap, or use any violent exertion without much risk; the youth, trained to the habitual and free use of his muscles, can hardly suffer from any muscular exertion that he is capable of. In such, the blood-vessels yield to a sudden influx of blood; they contract vigorously upon it, and drive it onwards; and the sole effect is a general quickening of the circulation, without local congestion in any organ or structure. This state of things commonly lasts for many years; but towards middle life the man is less fitted for this; he does it with more inconvenience, and his doing so is attended with more risk. He may be stronger than at any former period of his life; he may lift a greater weight with greater ease; he may be able to walk or ride further without fatigue, than he could ever have done previously; but this is not the question. He can endure fatigue better; his muscles are stronger and more firmly knit; but the several parts of his system have a less power of accommodation; they less readily adapt themselves to any sudden changes; a sudden and considerable rush of blood into any part is less easily made room for, and less

quickly got rid of; and although such a man can take more exercise with less inconvenience, yet violent exercise is taken with more risk. As years pass on, and the man gets older, this state of things increases; the blood-vessels yield less and less, their contractile powers diminish more and more, and violent exercise is taken with greater and greater risk, until it becomes impossible, or, of necessity, dangerous.

The sex, too, is a matter that must be attended to, in estimating the kind and the degree of exercise. The feelings of civilised society have made a just distinction between the sports of girls and those of boys; but it is not with such distinctions that this work has to do. Girls and boys may be said to be on a par until the age of ten or eleven years; but there is, even before that time, a difference between them; a difference as to strength and power. The boy will bear more exercise, and usually will bear more violent exercise, than the girl, without inconvenience. After the age of puberty, this difference becomes greater and more manifest. In general, young women, particularly if in a station of life where little or no personal exertion has been necessary, should not, without much caution, be allowed to take long-

continued or violent exercise. It is well to begin by making the girl walk gradually more and more every day, always keeping the degree to which this is carried *within* the powers of the individual: then to make her swing her arms to and fro, for a longer or shorter time: then by degrees to do this longer at a time, and more rapidly; and then, and not till then, to allow a more active and violent kind of exercise. The game called "The Graces," or "*Les Graces*," is a gentle introduction to the latter; and after it has been persevered in for some time, the skipping-rope may be used at separate intervals during the day. With boys, lads, and young men, less caution is in general necessary, less preparation is required; but among them there are some that are delicate, of lax fibres, and weakly constitutions, with whom such caution is imperatively required. For such, it is necessary, and perhaps for all it is well to begin with a daily, systematic, and judicious degree of walking; adding to this, after a longer or shorter time, any simple exercise of the arms; and to this the use of dumb bells, climbing up a rope by the hands, or any other similar and active kind of muscular exertion.

The habits of the individual, and his or her



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usual employment, must be considered, in estimating the kind of exercise they should use, and the degree to which it ought to be carried. The more sedentary the occupation, the less varied and more uniform the habits, the more cautiously and gradually ought exercise to be used. I had lately two patients, one an engineer, the other a slater, both men of active habits, both of them having had employment in which a good deal of muscular exertion was used. For them both, exercise in the open air was a primary and essential ingredient in the treatment. I advised them to walk a great deal in the open air. One of them, to my astonishment, walked sixteen miles a day regularly without inconvenience, the other could walk twenty-four miles without feeling tired! How marked is the distinction between these men and a tailor or a shoemaker; who, seldom moving from his shopboard or his last, and only removing thence to his lodgings and his bed, finds every, however trifling degree of exercise, fatiguing, and cannot, without difficulty, walk more than a mile or two a day. This must be attended to in prescribing, and in beginning to use exercise, both as to its kind and as to its degree. This, however is an aphorism to which

the exceptions are comparatively few—the more exercise fatigues, the more necessary is its use.

The strength of the individual must, as has more than once been mentioned, be constantly regarded with reference to the amount of exercise to be taken, and the degree to which it should be active or violent. If the kind and the degree of exercise be not proportioned to the individual's strength, it is useless; or rather, it is worse than useless, for it does harm. If it be not sufficient, the individual had better, in general, not take it at all. The life of the strictly sedentary is, it is true, almost always short; but that life is often passed in moderate tranquillity of mind and body, until disease seizes on its victim, debilitated by his habits, and rapidly carries off its prey. But if the individual use a little, but insufficient exertion, a restless irritability of mind and body commonly makes its appearance, which embitters life more than pain, more than disease, and prepares the system to receive the inroads of the maladies to which it is predisposed. If the exercise be excessive, it debilitates instead of strengthening; it takes from, instead of adding to the powers; and is in itself a fertile predisponent to disease.

The degree of strength or power that exercise requires and exhausts, depends as much on its violence or activity as on its duration. The weak should walk at first slowly, move sauteringly along, gradually, as the strength improves, increasing the distance walked over and the rate of motion.

Both the extent to which exercise should be carried and its activity, must always be proportioned to, and kept within, the individual's powers, to be productive of real benefit to the health. Exercise should be daily carried to the confines of fatigue; but it should never produce absolute weariness*.

The degree to which the mind is occupied, has much to do with the amount of exercise that may be taken without fatigue; and it has much to do with the amount of benefit that will be derived from it.

"A sportsman," says Dr. Kitchiner†, "habituated to ease and luxury, will rise with the

* "Exercitationis autem plerumque finis esse debet sudor, aut certè lassitudo, quæ citra fatigationem sit; idque ipsum, modo minus, modo magis faciendum est. Ac ne his quidem, athletarum exemplo, vel certa esse lex, vel immodicus esse labor debet."—Celsus, lib. i. cap. 2.

† "The Art of Invigorating and Prolonging Life."

sun, undergo the most laborious exercise in hunting a stag, hare, or fox, for the space of half a day, not only without fatigue, but with benefit to health, owing to the amusement and hilarity which the mind enjoys; but were the same gentleman compelled to go through half as much exercise which afforded no amusement, his fatigue and disgust would be insupportable. This is every day the miserable experience of men who were once engaged in the habits of industrious trade and bustle, and whose success and wealth have encouraged and enabled them to retire from business: they find life a burden, and, not having a pleasing object to encourage exercise, they acquire a painful *ennui*, and find they have exchanged the *otia* for the *tædia* vitæ. It is here that various exercises have been suggested as succedanea; but, alas! they all fail, because they want the pleasurable zest. The dumb bell is tugged, the feet and legs are dragged along the walks and avenues of a garden, but alike uselessly."

It is necessary that allusion be made to the effect that the kind of complaint, or disease, which may be present, should have on the selection of the kind of exercise to be used. Most of the other matters that have been men-

tioned might perhaps occur to, and at all events may be understood by any reflecting mind; this requires experience to regulate and guide it. A disordered or diseased condition of most of the great organs in the head, chest, or abdomen, renders any kind of violent exercise highly improper and most dangerous; yet a disordered state of some of these organs admits a nearer approach to violent exercise than such a state of some of the other organs. For instance, in many cases of disordered lungs, or liver, exercise on horseback is of the greatest use, and is perfectly safe, and free from risk; while in many cases of disorder of the brain, or of the heart, exercise of so active a kind would be accompanied with present inconvenience, and be attended with considerable danger: these cases would probably be most benefited by quiet and gentle walking, or by riding in an easy and open carriage. In spinal cases, on the other hand, any sitting or standing posture would be perhaps painful, and certainly injurious; and a vehicle long enough to enable the patient to lie down on a mattrass, with curtains that may be drawn or undrawn at leasure, and so afford the invalid the benefi of a change of air, together with that of an

easy, rocking motion—completely passive—furnishes the kind of exercise that is most suitable to such cases. This head has been included as a caution, rather than as an instruction to the invalid. The practical working of it, the application of it to individual cases, must be left in the hands of the medical attendants. A stricture on what is too usually the practice with regard to these, so called minor matters, is all that need be added under this head. If exercise is advised, particulars as to the kind that should be used, or the extent to which it should be carried, are seldom asked for, and seldom entered into. The blame of this rests somewhere; either with medical men, or with the public. It is to be hoped that the time will shortly come when such a charge could only be retrospective.

The healthiness of the mental powers, their capability of high and noble aspirations, their aptness for deep thought or improving study, depends so much on the health of the body, on the regular discharge of its every function, as to prove in itself perhaps the strongest motive, for giving attention to the means, by which such a condition of the bodily functions may be maintained or restored.

"Corpus enim male si valeat, parere nequibit
Preceptis animi, magna et preclara jubentis*."

As there is no means of effecting this of such universal applicability, or so uniformly efficacious as bodily exercise, so ought every man who thinks that all things should be made subservient to the mind's improvement, cultivate bodily exercise, if for this reason only.

I shall conclude this chapter with a summary of the foregoing remarks.

Exercise is serviceable in proportion to the number of muscles which are called into action; in proportion to the degree to which each muscle is contracted; in proportion to its duration; in proportion to the purity, the dryness, and the temperature of the air which is breathed at the time of taking it; in proportion to the time of taking it, neither immediately before, nor soon after eating; and in proportion to the regularity with which it is had recourse to.

* The following absurd doggrel will convey to the mind of the unlearned reader some of the meaning of the above beautiful couplet:—

"A body out of health is a rank rebel;
The mind commands, but it commands in vain:
And he who wishes that his mind be *able*,
Must keep his body free from ache or pain."

CHAPTER III.

> The cause, though worth the search, may yet elude
> Conjecture and remark, however shrewd.
> They take, perhaps, a well-directed aim,
> Who seek it in his climate and his frame.
>
> COWPER'S TABLE-TALK.

THE effects which air, pure air, change of air, produce on the health of man; on the discharge of his mental and bodily functions; on his spirits, his temper, almost his disposition; on the vigour of his memory, the correctness of his judgment, the brilliancy of his imaginings; are so great, that I shall devote a chapter, although a short one, to its almost exclusive consideration.

I have more than once alluded to the wonderful and surprising influence which changing the atmosphere from the impure state in which it necessarily is in the sick room, to the purer state in which it is in the open, and dry, and

upland country, possesses over the health. That which was then only glanced at, must now be briefly examined, and the subject investigated somewhat more at length.

The importance of VENTILATION, much as it has been urged on public attention, is not yet sufficiently estimated. Are not bed-rooms still built *low* and small? Are not beds still surrounded with closely-drawn curtains? Are not bed-rooms still crammed with furniture, and their floors *covered* with carpeting—at times even under the beds, where a carpet is not, cannot be wanted? Do not people sleep with the door and windows of the bed-room closed, with a light, and not unoften that light *gas*, burning in their bed-rooms? Can it be contended that they either understand ventilation, or appreciate its value?

The atmospheric air, composed principally of two elements, oxygen and nitrogen, is changed by respiration; and consisting, before inspiration, of twenty-one parts of oxygen to seventy-nine parts of nitrogen, or twenty-one per cent. of oxygen; it contains after expiration, probably at the lowest computation, three and a half per cent. of carbonic acid, or, on an average, twenty-seven and a half cubic inches of carbonic

acid are evolved from the lungs every minute, or about forty thousand cubic inches in twenty-four hours, which weigh nearly three pounds, and contain about eleven ounces of carbon.

Now the rapidity with which this vitiation takes place, may be conceived by knowing the fact, that at each respiration sixteen cubic inches of air are, on an average, deteriorated, and that about twenty such respirations are taken in a minute; therefore three hundred and twenty cubic inches of air are each minute poisoned by every individual, and rendered unfit for the support of life. The consequences which must follow, even on a simply chemical view of the matter, if a man is confined eight hours in a shut-up bed-room, are obvious enough. But this is not all: with the expired air a large quantity of watery vapour is exhaled from the lungs; a fact which demonstrates itself by the vapour being condensed in cold weather, and in winter sometimes frozen on the bed-room windows; a fact which shows itself in the dampness of the clothes, particularly woollen clothes, which have laid all night in a closely shut-up bed-room. Nor is this all: the skin is actively at work evolving its secretions, among the rest, a highly volatile and, in some persons, most

offensively smelling substance, which, mixing with the air, taint it more and more—render it more and more impure—more and more unfit for respiration.

The effect of a burning candle or lamp in increasing these evils, is precisely that which a second person in the room would cause, seeing that, during its combustion, it takes the oxygen from the air, and replaces it by carbonic acid.

The effect of a fire, if it is a very small one and the room large, is rather favourable to ventilation than otherwise. But this is a nice question, one with difficulty adjusted, and one which, unless the bed-room is particularly large, should not be tried, For if the room is *heated*, the air is rarefied, is expanded, occupies a larger space in proportion to its weight, and therefore at each aspiration less air is *really* breathed; the blood is consequently not so freely and completely aërated. But there is likewise another effect. If the air is heated the body is heated, the vessels of the skin excited, and the result is either an excessive secretion of its fluids, and consequent and unnecessary and injurious exhaustion, or, failing this, a hot, and dry, and feverish skin. But even this is not all. Blood, when heated, occupies more bulk, more space,

and the consequence is fulness of the vessels, undue pressure on the brain and nerves, and therefore torpifying, lethargic, unrefreshing sleep, or otherwise a restless excitability of system. Both these effects must have often been felt by the man who has indulged himself with a heated bed-room. These effects must have been frequently felt by most men in a hot sitting-room. The first effect of the heat is, I think, usually some sense of oppression in the breathing; this is succeeded by a feeling of drowsiness and torpor, and if this is not relieved, it is followed either by a deep and heavy sleep, or by restlessness and nervous irritability; and, if this state of things is allowed to continue, it is succeeded by languor and exhaustion; the state of system, in fact, in which cold is most sensibly felt, or in which it is most apt to be followed by local determinations of blood, by inflammations, &c.

The bed-room ought not then to be *heated*, but, on the contrary, to be kept as cool as is consistent with the feelings and the health, and means ought always to be taken to secure a constant change of air in it. For these purposes, either the door ought to be left partially open, or the windows opened a little at the top. No

fire ought to be allowed, unless under very particular circumstances, if the room is not unusually large, and even then the fire ought to be a small one. The curtains of the bed ought to be of as light a texture, and they ought to be as little drawn, as possible; the floor only in part carpeted; and there ought to be only necessary chairs, tables, &c. Furniture to a remarkable degree prevents free ventilation, and all woollens, as carpets, absorb the moisture, whether from the breath or in damp weather, and so render the air less pure and more relaxing. A light ought not to be allowed in a bed-room, if it can be avoided; if it is *necessary*, let it be put in the fire-place. *Gas* ought never to be burned in a bed-room. Of the importance and value of gas it is not for me to speak here. I am not about to decry it as a street-light, or as a shop or warehouse, or passage-light, but as a mode of lighting dwelling-houses, and especially bed-rooms, I do think that it cannot be sufficiently decried. In itself a *poison*, carburetted hydrogen, or coal-gas, cannot be burned in any hitherto contrived way without allowing some portion to escape unconsumed, and this diffusing itself, is, it is true, diluted, but still it

is noxious; and I have repeatedly known it to produce, indeed, I have repeatedly experienced, its bad effects. Even in the theatre and the ball-room, many persons must have felt the headach, and giddiness, and sense of faintness, which this unconsumed gas produces. The effect which breathing it, night after night, during sleep, produces, is more insidious, but is, at all events, not less considerable. Until gas is rendered still purer than it yet is, and until a burner can be found which will enable every particle to be consumed, it should be banished from the bed-room, the sitting-room, and, unless there is free ventilation, even from the public room or the theatre.

A bed-room ought not to be on the ground-floor, but rather on the first or the second. Yet it is well that it should not be in the upper story of the house, at least if the house is much exposed to the sun's rays, and the upper rooms are heated by them. For the same reason, it is generally well that the bed-room should not be on the sunny side of the house.

These rules may, to some, seem simple, to others even trifling. I might easily, were it not foreign to my present purpose, illustrate

their importance by cases and facts. Let them be *tried*. It will be time enough to think lightly of them, when they are found to be useless.

Many persons are in the habit of indulging themselves by having their bed warmed with heated coals every night; and they would, probably, if the practice were reproved as wrong, say, that if it were not done, they would be chilled by the coldness of the bed, and, not recovering their heat, would pass sleepless nights.

But instead of being satisfied with this answer, they should ask themselves, "Why is it that I require my bed to be warmed, while most people contrive to do without any such indulgence?" A heated bed is injurious. If heated with coals, the air of the room is deteriorated by their combustion, if not by their smoke; and, however heated, it enervates, it weakens, it renders the skin susceptible to modifications of temperature, and therefore the system liable to suffer from the ordinary vicissitudes of our climate. Why is it wanted? Is the man in a debilitated state? If so, I would say, indulge him until he has recovered his strength. Is he labouring under some severe disease? Is it a sort of placebo? Does it soothe and tranquillise

him, and can it not make him worse? Well, then, under such circumstances, continue the practice. But is the man in moderate health? Then, depend upon it, the chances are, either that he keeps himself in a heated atmosphere, dreading lest the *winds of heaven should visit him too roughly*, or his stomach is weak, or disordered, or some of the organs concerned in the digestion of his food have either too much to do, or are more or less disturbed in their functions. Let such a man try the effect of a regulated and moderate diet, of temperance, of daily exercise in the open air, and, till these have exerted their influence, let him keep his feet warm by a bottle filled with hot water, or any similar contrivance, and till then, or even afterwards, let him substitute calico for linen sheets.

Upon the value of ventilation in fever and other diseases, I must not enter in this work.

I have said enough to show the folly, and inutility, and injurious effects of a heated atmosphere in the bed-room. I would, with some modifications, extend these remarks to the sitting-room. The cooler it is, consistently with health, the better; and, let me say, that if the individual takes enough exercise, if he uses

muscles enough, and uses them sufficiently, and if he is as much out of doors as he ought to be, he will not, even in the depth of winter, require much fire, and will moreover be contented to have the door of the room open, or the windows partially so at the top. This may seem an outrageous sort of doctrine—one subversive of fireside comfort; but let me remind the reader that there is no comfort without health, and it is for, and in the behalf of health, that I am writing. But what is better known, than the stupifying effects of a hot room on a social or family party? What is better known to the man who studies much, than the impossibility of applying his mind to serious business in a hot, or even warm, room, from the lethargy which it always produces?

But further, and it is perhaps even more important, this undue heat increases the chance of suffering from exposure to cold air, not only by heating the body and making the contrast between them greater, but by producing exhaustion, and in this way it renders the risk infinitely greater. It is in this way that the heated ball-room or theatre does so much harm, lays the train for so many afflicting cases of premature death. It is not only by the contrast between

the temperature within and that without, but by the exhausted condition into which the heat throws those who have been exposed to its influence; the condition in which the circulation of the blood in the skin, being languid, is most easily checked, and the blood, thrown on some internal, and probably vital organ, sows the seeds of consumption, &c. &c.

Enough has been said of the temperature of rooms; it need only be added, that fires certainly subserve, more or less, the purpose of ventilators, by heating the air and causing it to go up the chimney, that air being replaced by cold air, which enters at the door or the windows. And therefore, if rooms are heated by steam-pipes, or in any similar way, it is necessary to adopt more active and unusual means to secure ventilation.

I now come to speak, unfortunately it must be in few words, of the influence of CLIMATE on the health of man.

I will premise what little will be said by expressing how much I owe to Dr. Clark's work on this subject*. It is a work which should be carefully perused by every invalid,

* The Influence of Climate in the Prevention and Cure of Chronic Diseases, more particularly of the Chest and Digestive Organs, &c. &c. By James Clark, M.D., Jun.

before he leaves his home in search of health, under either warmer, or drier, or less variable climes.

The various regions of the globe differ from each other in average temperature, in range of temperature, in the frequency of change of temperature. They differ from each other in the moisture or the dryness of the air. They differ in the aspect to which they are exposed, in the side or sides on which they are sheltered. They differ in soil, in elevation, and in many physical circumstances, which need not be mentioned here, as they do not directly influence health or disease.

Most invalids, if a removal from their own climate is necessary, provided that is in a temperate region, require that it should be to a climate which is warmer rather than colder; to one in which the variations of temperature are as few and as slight as possible; to one which is drier rather than moister; to one the aspect of which is southerly, which is sheltered on the north and east sides; to one the soil of which is rather light and dry, and which is elevated considerably above the level of the sea.

There is scarcely a locality which combines all these qualifications; and, indeed, different

diseases and individual cases present so many points of contrast, they differ so much as to character and degree, that perhaps this is less to be regretted than is commonly supposed.

The dyspeptic should migrate into a climate, the air of which is dry. A damp air is relaxing, and will usually weaken rather than give tone to his system. To pass his winter in a milder climate usually does him good; but the question for him to consider is, whether his powers are such as to bear better, and be most benefited by, an air which is warmer but more moist, or by one which is colder but more dry; for the moist air is almost always that which is most warm.

If the preference is given to the milder, but moister air, he should choose Devonshire, especially Torquay; Cornwall, especially Penzance, Guernsey or Jersey*; the south-west of France, especially Pau; Italy, especially Rome in the winter season; the neighbourhood of Naples in the summer.

But Madeira is the place which, of all places,

* I would refer the reader to a most interesting chapter "on health and disease in Jersey, in relation to the influences of climate, &c." by Dr. Scholefield, in Mr. Inglis's work on "the Channel Islands."

Dr. Clark thinks deserving most particular notice. It is warmer in winter and cooler in summer, than any part of either Italy or France. The rain falls at more regular seasons, particularly in the autumn, leaving the weather generally dry, and the air clear, for the remainder of the year.

This I have thought to form a link between those climates that are moist and warm, and those that are dry and somewhat cooler.

In the latter class may be included Hastings; Undercliff, in the Isle of Wight; Clifton; the south-east of France, especially Nice.

The above observations apply only to those places as winter residences. For a summer residence, the invalid need hardly leave the shores of Britain, but rather fly to Malvern, or Leamington, or Cheltenham, or Tunbridge Wells, or Matlock, or Buxton. If a mineral water is to be used, that must of course be considered in connection with the climate. The subject of mineral waters will be mentioned elsewhere.

I will conclude these remarks by saying, that the invalid will generally do well to spend his summer in a place where the air is dry, open,

and somewhat bracing, than where it is moist, close, and relaxing.

The subject of climate naturally leads me to speak of *change of air*—one of the most important and most useful of remedial agents.

A man can scarcely be in a state of such perfect health as not to be benefited by change of air. It is *necessary* for every man. The workman must leave his workshop, the student his library, the lawyer his office, or his health will pay the penalty; no matter how great his temperance in eating or drinking; no matter how vigorously he uses his limbs, no matter how open, and dry, and cool, may be the place in which he is employed.

Dividing air into that which is moist and warm, and into that which is cold and dry, its action on the *healthy* body may be said to be this: the air, of which moisture or warmth (one or both) are the especial characteristics, excites the action of the skin and of the liver, and produces a more or less relaxed state of system. The air, which is characterised by coldness and dryness, excites the organs of respiration, and promotes the amount of their secretions.

The influence of the air on disease may be in part gathered from the above. It well deserves mention, because it is as an agent, the application of which requires care and judgment. The influence of change of air on disease is well known to be great; but it is not so well known that, given in one way, it does harm; in another, it does good; in another, is inert and useless.

The man labouring under indigestion (the effect of sedentary habits and repletion) would probably be injured by a removal to a warmer and moister air than that to which he had been accustomed; but would be benefited by a change to an air colder and drier than his own. The irritable sufferer from dyspepsia, the result of deficiency of proper nourishment, or of powers too languid to convert his food into blood, would probably be deprived of life by a removal to a colder and drier air, be restored to health by a change to one warmer and more moist.

In proportion to the weakness, the irritability, the sensitiveness to every impression; in proportion to the degree of mental *excitement*, ought the change to be to an air which is softer and warmer.

In proportion to the strength of the body, the lethargic state of its powers, the dull condition of its sensations; in proportion to the mental *despondency*, ought the change to be to an air which is drier and more cold.

There are states of highly irritable system, in which almost any kind of food is felt by the stomach, and gives it uneasiness, or in which a little dust floating in a room produces a fit of coughing; or in which breathing a colder air than usual produces the same effect—the cough being dry and almost *tinkling;* or in which the gentlest aperient produces pain, and, perhaps, diarrhœa; or in which the most common domestic occurrence vexes and annoys. Any such state will probably derive advantage from a mild, soft air; and would probably be injured by an air of a different kind.

There are states of system in which there is excessive languor and relaxation, in which the stomach, so far from feeling almost any kind of food, is hardly roused into action by spirits or condiments; in which the strongest and most drastic cathartic seldom produces even uneasiness; in which severe domestic trials hardly produce even a temporary im-

pression; in which secretion is free; in which, if there is cough, it is loose and unirritating. Such a case would probably be injured by the relaxing and soothing effects of a soft warm air, but would derive benefit from an air at once dry and somewhat cold.

Again, change of air, to be of service, should be well timed; and should, if possible, be obtained in an early period of a chronic and lingering disease; and not be deferred longer than can be avoided, in convalescence from active or inflammatory affections.

Again, the more impure and close the air has been to which the person has been accustomed, the more cautious and deliberative should be the change; but the more imperatively is such change called for.

Again, the younger the person, the *greater* the benefit to be derived from a change of air; and the more necessary and advisable will such change be.

Upon these, a few observations may be useful.

If a man finds himself attacked with a disturbed state of his digestive or biliary organs; and if such state should not speedily yield to

regulated diet and exercise, and the usual medicaments, let him not waste his days and weeks in *trying* this or that thing, or trusting to the beneficence of nature, or the *strength* of his constitution; but let him try what *judicious* change of air will do for him.

If a man is attacked with shortness of breath, cough, and irritation about his respiratory organs; and if urgent symptoms are relieved; or, *better still*, if they have not yet come on; let him try the effect of change of air. In cases of this kind, delays are not only dangerous, but often fatal.

There is no time at which a man is more apt to contract organic, or structural disease, than immediately after an active disorder has subsided, during his debilitated convalescence. A *judicious* change of air, as a means of accelerating his restoration to health, as a means of lessening this risk, is invaluable; and, where it can be accomplished, should never be neglected.

The *young*, whether well or ill, are always advantaged by change of air. If brought up in a large town, an occasional change to the air of the country is almost necessary to give them

strength and sound health; and should always be contrived by parents when at all in their power. After an illness, change of air is almost necessary to the young invalid. Many children, I am satisfied, fall into permanent and incurable disease, who would at once have recovered had this been attended to.

Change of air ought, however, in most cases of disordered health, to be had recourse to only under the especial advice of the medical attendant. All that I would imply by the above remarks,—all that they have been written for,—is simply this: It often happens that a man feels unwell, yet would at once reject the idea of applying for medical advice; although, if change of air were suggested to him, he would unhesitatingly try its effects. It often happens that medical men feel change of air to be advisable, yet do not say so; from a fear lest the proposal should only distress the patient, by telling him of a remedy which is beyond his reach. It not unoften happens that patients, or their friends, get false ideas into their heads: and, among others, fancy that change of air is always ordered as a forlorn hope, or as the last remedial means left to be tried. It is

chiefly for the benefit of such cases that the above observations are intended.

The change of air which, in cases of *comparative* health, I would especially advise, is that embraced in constantly moving from place to place, taking as much personal exercise, during the journey, as is found to be possible. I have often been struck with the fact, that an Englishman will unhesitatingly set off to the Continent; go among a people whose language he is perhaps quite ignorant of; whose habits are quite foreign to his own; whose houses are, except in great cities, such as to disgust him; whose style of living is such as to make him almost loathe the sight of food; whose country is probably not comparable to some parts of his own; yet he will, at considerable expense, transport himself there. For what purpose? To set out on a pedestrian tour with a stick and a bundle,—an undertaking which he could more cheaply, more improvingly, and with evidently greater advantages, and probably with quite as much benefit to his health, have performed at home; or he does this to bathe in *thermal springs*, which are probably not better for his case than those of Buxton or Bristol; to drink

salines, possibly not equal to those of Leamington or Cheltenham; or *chalybeates*, perhaps not better than those of Tunbridge Wells; or *sulphurated waters*, not comparable to those of Harrogate. It is very well to say to the man of wealth and independence, "Oh, sir, medicine is really not calculated to effect your cure. Get together your travelling suite, your carriage, and your servants, and go to the Continent, and visit the 'Brunnens of Nassau,' or the 'Tyrol,' or the south of France, or Rome, or Naples." But this sort of advice, to the great mass of the people of Great Britain, even of the middling classes, is only like filling their hands with water, which, thirsty though they be, is never to reach their lips; or, suspending viands before their eyes, which are destined for ever to elude their famishing and eager grasp. Let me say to such (and it is an advice which would be re-echoed by every medical man in Great Britain), you have little cause to envy your wealthier brethren their unbounded freedom of far and wide migration. To taste all the pleasures which the best and most healthy of all kinds of travelling affords, you need not leave your native land; but, with some shillings

or pounds, according to your means and your expectations, and a bundle, containing a change or two of linen, and an extra pair of shoes, hung over your shoulder by a stick, you may wander over the highlands of Scotland, over Cumberland, or Westmoreland, or Wales, or last, but not least, Derbyshire; and, with a thorough British feeling, expressive of the words, "This is my country," admire the beauties of the woods and plains, the grandeur of mountain scenery, be warmed into a taste for the sublime and the beautiful, by seeing nature in all her inimitable, unartificial, and untouched freedom, and by seeing her decorated, and made more useful, by the hand of man; and you will, after a ramble of weeks or months, as may be, return to your home with the feeling, that what travelling and change of air and scene could do for man's health, it has done for yours.

It is this sort of travelling; this total removal from ordinary and every day habits; this constant exercise; this continual change of air, which does most good: that, if the man is in moderate health, gives vigour to his system, freedom to his limbs, and clearness to his mind, which will, like magic, uproot many a case of

long continued dyspepsia, and cause many a chronic disease, threatening to degenerate into something worse, to be no longer felt.

Change of air may be too great; but it cannot be too frequent, if the powers of the system are not materially impaired.

In many, the majority of cases of indigestion, the spirits are either very much depressed, or the mind is in a state of highly morbid irritability. There are few diseases, in which the remarkable sympathy which subsists between the body and the mind, is so clearly seen as dyspepsia. The consequence of this sympathy is that the patient looks at every thing in the darkest and blackest light; magnifying trifles into affairs of moment; is tormented witha constantly cavilling, wretched sensitiveness. It is necessary then, not only that the body should be exercised, and its muscles actively used; not only that the stomach should be as little distressed by work as possible; not only that change of air, frequent change of air, should be enjoyed; but it is necessary, moreover, that the mind should be taken away from its cares and troubles, from the customary sources of vexation; and be amused with variety, without knowing how: an amusement which is well furnished by the fresh

scenes, the fresh faces, and the various and numberless interesting matters for observation, that a tract of country before unknown to him must ever present, even to the commonest observer.

Travelling, and especially pedestrian travelling, presents, among its many other points of excellence, this in a remarkable degree. It acts directly on the mind as well as on the body. I am satisfied that if the measure were tried in cases of hypochondriacism, in cases of incipient insanity, many a one would be restored to his reason, his family, and his friends. The effect of such travelling cannot be sufficiently estimated. It would enable many an invalid, at a cheap rate, to show "clean bills of health." I think that few will say the prescription is not palatable.

CHAPTER IV.

——Nil fuit unquam
Tam dispar sibi.

HORACE, SAT. 3, B. 1, v. 18.

A perpetual satire upon itself and its uses.

THE great extent of the surface of the body, and the vast amount of secretion constantly proceeding from it, either in the unperceived form of a vapour, or in the sensible form of a fluid, renders the functions of the skin an interesting subject of investigation, and a regular and adequate discharge of them not only important to the health, but necessary even to the existence of man.

It may not be known to all my readers that the average amount of secretion for the skin in the twenty-four hours in our climate, may be stated on the highest authority * to be not less than thirty ounces; a quantity, however, which

* Lavoisier and Seguin.

varies with the temperature and humidity of the atmosphere. In warm weather it is greater, in cold weather less. In hot climates the average quantity *per diem* is probably not less than forty ounces.

Of the *extent* of the secretion from the skin no more need be said. The *importance* of its functions is not less great. Of so great moment are they, that whatever unduly checks these secretions,—as cold, by suddenly chilling the skin, carrying off rapidly its heat, and so impeding the circulation of the blood through the vessels, which are ramified over it, is almost certain to be followed by more or less disease. But this is not all. There is a mysterious dependence between the several organs and functions of the body; a sympathy communicated through the medium of the nerves which supply them with their properties and their powers. This sympathy subsists in an especial manner between the stomach and the skin. Most men have felt the chilled condition of the surface, at times even amounting to that called "goose's flesh," which the digestion of a heavy dinner so frequently causes: this is owing to the sympathy between the stomach and the skin. It is more than probable that many of my readers will remember

having had a fit of indigestion from having been exposed to a cold wet air, from not having changed their clothes after exposure to rain, or from having suddenly changed warmer for slighter clothing: this is owing to the sympathy between the skin and the stomach*. To the medical man, if such there be among my readers, many similar examples will readily occur; to the public enough has been said to prove that this sympathy is great, and, in its effects, powerful; and hence, to preserve the balance of the circulation, a balance which cannot be disturbed

* The first of these cases might possibly be accounted for, by the great quantity of blood which would be directed to the stomach, to enable it to digest so large and obstinate a mass of food. But still the other case involves the necessity of an appeal to the commoner solution, sympathy. For, according to the former theory, a chilled state of skin, by throwing the blood upon the internal organs, and, among the rest, the stomach, ought to facilitate, rather than interfere with digestion; an effect, by the way, which, as every body knows, exposure to a *dry* and *cold* air almost always produces. But the cases are cases of mere sympathy. If, for instance, by excessive heat or excessive cold, the powers of the skin are depressed, those of the stomach are usually depressed too. Few men are happy enough to retain their appetites in the hot summer's day, or in the cold and damp day of winter. On the other hand, if the cold or the heat does not go so far as to overcome the powers of the system, but only to rouse it into an effort to resist their influence; the effect is that of increasing the energies of the skin: but the energies of the stomach are, *ceteris paribus*, in an equal ratio excited and increased.

without producing some degree of congestion, and without running a risk of producing inflammation in some organ or structure; to encourage the secretion of the skin, a secretion which cannot be diminished without producing a corresponding fulness of the blood-vessels, a fulness which is almost always fraught with danger; and to prevent the sympathetic disorders of other organs, which are so apt to follow a disturbance of the functions of the skin; it is necessary to cover the body in a manner uniformly proportioned to the climate and the season.

Substances part with their heat in two ways; one by *contact*, the other by *radiation*. We have, at present, only to do with articles of clothing. So far as these are concerned both modes must be briefly considered.

Some substances neither readily receive, nor readily part with heat; others receive it quickly, and part with it quickly. The former are called bad, the latter good conductors of heat; the former are warm to the touch, the latter cold; the bad conductors afford the best protection against the cold, the good the worst; the bad conductors confine most completely the animal heat, the good conductors allow it the most readily to pass through them. The following,

beginning with the *best* conductors, may be considered to be the order in which they ought to be classed.

1 *Flax.* 2 *Silk.* 3 *Cotton.* 4 *Wool*[*].

Flax is a much better conductor than silk; silk is a somewhat better, but not much better, conductor than cotton; cotton a much better conductor than wool.

Many substances, which are used directly or indirectly as articles of clothing, have not been mentioned, from the difficulty or from the inutility of classing them. Thus, feathers and down are bad conductors. Hair woven into a cloth is *rather* a good conductor, but in the state of fur is a very bad conductor. Wood, and especially cork, are bad conductors. Metals are good conductors. Leather and dressed skins are bad conductors, and would probably be classed between cotton and wool.

* I have thought it to be more succinct and more clear to mention them in this way, than to attempt an enumeration of the several fabrics. Any one may estimate the comparative warmth of an article, by knowing the material or materials of which it is made. Thus, all woollens, as cloths, worsteds, stuffs, merinoes, &c., are warmer than cottons, as calicoes, commons prints, &c.; and these than silks, spun silks, &c.; and these than linens, muslins, cambrics, &c.

In a climate like ours, which is variable, and rather cold than warm, the article of dress worn next to the skin ought to be a bad conductor of heat; consequently, flannel ought to be worn next to the skin: and if this cannot be borne, or, at all events, if it prove too much for summer, let calico be substituted for it. Linen ought not to be worn next to the skin, unless by the very robust. Let the thickness of the flannel or calico be proportioned to the habits, age, and constitution of the individual, and safety and comfort will be conjoined. Many prefer wearing leather as the under garment, because it does not irritate the skin so much as flannel. Leather is chiefly objectionable from its not affording, however well dressed, so ready a passage to the insensible perspiration as flannel or calico. I think that thin and very fine flannel is preferable; or that this, lined with calico, or even calico alone, is generally better.

But, strongly as the importance of having a bad conductor next to the skin should be impressed on the minds of all, there is a point connected with it, which is almost as important. This inner garment, especially if flannel, ought not to be worn at night. It ought invariably

to be taken off at night, and as invariably to be resumed in the morning. In bed it is unnecessary; it is worse than unnecessary, for it does harm: it then unduly stimulates the skin, and produces a preternatural waste of secretions, and corresponding debility of system—a corresponding liability to suffer from the depressing influence of cold—a corresponding incapacity for resisting its influence. But further; removing this garment during the night relieves it from the scurf, and other matters, which it must, during a day's wear, acquire, and so renders it fresh, and more agreeable to the sensations of the wearer. Not wearing it at night renders it more effectual in protecting the surface from the cold by day; on the principle, that a great coat is not of the same service to the wearer when out of doors, if he is in the habit of wearing it in the house.

In corroboration of the above observations, and in the hope that my doing so may impress the minds of my readers more deeply with the importance of a matter which is commonly quite overlooked, and which cannot be too highly estimated, I quote the following, verbatim, from the work on "Scarlet Fever, &c.," by the late eminent and deeply-lamented Dr. Armstrong:

—"When flannel is worn next the skin, Dr. Barlow remarks, it is almost invariably the practice to keep it on by night as well as by day. This is not only unnecessary but injurious. The chief advantage of using a flannel dress next the skin, results, not from the actual warmth imparted or retained, an effect which might be obtained to an equal extent by an increase of outward clothing, but from the uniformity of temperature thus ensured to so large a portion of the surface of the body, and the tendency which this has to keep the highly important, but too much neglected, functions of the skin in an active and healthy condition. During the day, the frequent, and oftentimes sudden, vicissitudes of our climate, are such as to render the effects of flannel, in preserving an equality of temperature, most valuable. But at night, and during sleep, we are subject to no such vicissitudes; consequently, the same necessity for the use of flannel does not then exist. But while the use of flannel at night thus appears to be unnecessary, there are several considerations which show it to be injurious. These considerations regard both the condition of the body and of the flannel itself. Whatever the wants of the body for warmth during

the night may be, they are in general fully supplied by the bed-clothes in ordinary use. The body requires no extraordinary warmth during sleep; on the contrary, there is at such times even a tendency to an increase of the natural warmth. When to this natural tendency, the heat caused by flannel worn next the skin is superadded, the effect is to keep the skin in a state of considerable excitement, and to induce perspiration, more or less profuse. These effects are not calculated to prepare the body for enduring the vicissitudes of the ensuing day, but rather to render it more susceptible of injury. Again," continues Dr. Barlow, "the property which renders woollen cloth so eminently suited to the purposes in view, is that of its being a slow conductor of heat. This property is directly proportionate to its dryness, and is greatly impaired by its imbibing humidity of any kind. A flannel dress, however, that is worn next the skin throughout the night, becomes so charged with perspiration, that its power of conducting heat is thereby greatly increased, and its preservative effects proportionably diminished. Here, then, is a two-fold injury resulting from the prevailing practice of continuing the flannel

dress during sleep; namely, a diminution of the preservative powers of the flannel, and an increased susceptibility of the skin. By laying aside the flannel dress on going to bed, and substituting one of coarse calico, the body is kept in that temperature during the night which fits it for encountering the vicissitudes of the following day; while the flannel is preserved from the deteriorating effects of the nightly perspiration, and is resumed in the morning, in a state which contributes both to comfort and protection."

But of all parts of the body, there is not one, the clothing of which ought to be so carefully attended to as the feet. The most dependent part of the body, this is the part in which the circulation may be most readily checked; the part most exposed to wet, to cold, or good conducting surfaces, it is the part where such a check is most likely to take place. Cold feet very commonly attend on disordered stomach; and yet disordered stomach is not more apt to produce coldness of the feet, than coldness of the feet is apt to produce disordered stomach; and this remark applies not only to indigestion, but likewise to many of the other disorders to which our frames are subject. Yet do we

see the feet of the young and the delicate clad in thin shoes; and as to their stockings, no matter whether it is summer or winter, no matter whether the weather is dry or damp, whether the temperature is hot or cold. But this is not the whole of the evil. These same feet are frequently, at different times of the same day, differently covered, both as to stockings and as to shoes. I have often found, on investigating into the origin of cases of disease, that it has been a common practice to go out of doors in the forenoon, the feet being protected with lambs'-wool stockings, and warm, thickly-soled boots; and to sit in the afternoon at home, only having those feet covered with silk stockings and thin satin shoes. I have so often found this to be the case, that it would not in the least surprise me were the practice found to be almost universal among the females of the middle and upper ranks of society. To this common, but thoughtless and irrational practice, have I traced many, fearfully many, cases of incurable disease. To this alone is to be ascribed many a case of functional disturbance; this lays the foundation for many of those derangements, by which the first inroad is made into the constitution, the first step taken in under-

mining the health, the first of that succession of changes brought about, by which the young, and the lovely, and the healthy, and the strong, are converted into the wasted victims of consumption, or become martyrs to other maladies as fatal, although less common. Let the health be more looked to, mere appearance less! Let people dress as common sense and their own feelings would direct, rather than as fashion, or custom, or society dictates, and many a piteous case of untimely death will be averted; many a wife be spared to her husband — many a mother to her child — many a child to its parents!

These observations lead me to touch, as briefly as may be, on the extreme imprudence, not to give what is possibly the mere effect of thoughtlessness a worse name, of having "the morning, the walking, and the evening dress" made of such very different materials, and in so very different a degree protective against the cold. How perfectly irrational it is to cover the neck and shoulders at one period of the day, and leave them uncovered at another; to wear a warm thick dress at breakfast, a cold thin dress at dinner, and in it to expose the person to the air of a cold drawing-room, or perhaps still

colder passage, or perhaps to the totally unmodified and unwarmed air of a winter's night. Yet such is the practice of thousands of the female rank and talent of the country; yet such is a common thing, confirmed by custom, which is looked for, expected from, and endured by the high-born daughter of nobility, by the heiress of untold wealth, and by the wife and child of the humbler citizen; and this, too, in days when every man, and woman, and child is said to be educated,—and educated, not from habit or custom, or according to any established form or usage, but educated to *think*.

Let it not be lost sight of, that such acts of imprudence may possibly, while the health is in high and unimpaired vigour, be followed by no bad consequences; yet that the slightest cause, such as sitting up one single night to a later hour than usual, or a slight attack of indigestion, or as over-fatigue, or contracting cold feet, or any other equally probable circumstance, may destroy the happy equilibrium, and enable the cold to check the circulation of blood in the skin, and thus to throw the blood upon some vital organ, giving rise to immediate disorder, and perhaps ultimate and not remote disease.

A man may get drunk every night, and, in a state of intoxication, mount his horse, and ride a distance of some miles to his home, and he may do this for months without any accident; but these escapes do not lessen the amount of risk that he runs; he is still liable to suffer, and perhaps to be killed, by the stumbling or shying of his horse, or by any other equally likely accident. The application is evident enough.

Thin shoes, as articles of female dress, I am sufficient of a Goth to wish to see disused; and I would replace them with shoes having a moderate thickness of sole, with a thin layer of *cork* or *felt* placed within the shoe, and over the sole. Cork is a very bad conductor of heat, and is therefore to be preferred: if it is not to be had, or is not liked, felt may be substituted for it. I think thin shoes ought not to be used, unless for the purpose of dancing, and then they ought only to be worn while dancing. The invalid or dyspeptic ought assuredly never to wear thin shoes. And as to the common practice of changing thin shoes for warm boots, it is a practice which I know to be replete with danger, and therefore to be rash and almost culpable.

There is another custom, or habit, or usage in the dress of my fair countrywomen which must

be noticed here; it is that of covering the head with a cap in the morning, and leaving it uncovered in the afternoon or evening. It is indefensible, useless, absurd, and dangerous.

But the custom of all other customs—the one which deserves most reprehension—the one most directly opposed to the dictates of nature, the most completely irrational, the most dangerous custom, the unsuspected parent of numberless diseases,—is that of tight-lacing; I had almost said, that of wearing stays. Habit leads men to the most unnatural conclusions. Fashion and custom are the parents of absurdity. Much as we may laugh at the effects which these produce on other nations,—much as we may ridicule the compressed, the crippled, and useless feet of the Chinese females,—they do not interfere with any important or indispensible vital organ by the practice. Much as we may view with an amused feeling of superiority the blackened teeth, the skin painted with many colours and grotesque devices, and the be-ringed nose and lips of the savage, yet these are only what they purport to be; they are to them ornamental; they do not interfere with the exercise of a single function; they do not even tend to disorder the health, injure the constitution, and curtail the, at best,

short span of human life. Far different is it with the European custom of wearing stays. Let any one who may now have his attention for the first time directed to this subject; let him compare his mode of breathing with that in which any female breathes, and think of what must be the probable effect of so great an interference with one of our most important functions. He will find that he breathes chiefly, if not wholly, by the diaphragm, or muscle which divides the chest from the bowels; that the rise and fall of his abdomen is the effect produced by his respiration; that he seldom, unless during or immediately after exertion, raises his chest or expands his ribs: whilst the female, her abdomen being confined by her stays, is obliged to perform this function by expanding her chest and raising the ribs.—But is this all? No! in a number of instances the busk, or central bone, or steel of the stays, presses on the stomach, and produces, by the *pressure*, disturbance of its functions, indigestion and its consequences. But further: the muscles of the spine being compressed by the stays, and the back not being dependent on them for support, shrink, become smaller, and consequently weaker; and the least debilitating cause affecting them through the

system, produces weakness of the back, stooping shoulders, and deformity; and then back-boards, and inclined planes, and other similar attendants on the use of stays, are resorted to, and in their turn, of course, prove the means of still further injuring the health, or disturbing the system.

These, however, are the effects attending the *use* of stays—effects which medical men are constantly called to witness. Their *abuse*—an abuse which female vanity or maternal pride is ever producing—is followed by consequences still more immediately serious. The ribs form more or less yielding walls to the cavity which contains the lungs and the heart; they are a series of bones, connected behind to the spine, and before to cartilages, or gristles, which intervene between them and the breast-bone to render them elastic, yielding, and more or less flexible. By tight-lacing these qualities, with which nature has for wise purposes endowed the ribs, to defend the heart and lungs from injury, to lessen the risk of undue pressure on them from without, or undue resistance to the exercise of their functions; these very qualities are, by tight-lacing, converted into pregnant sources of evil. The ribs and their cartilages yield to the pressure, the respiration and heart's action are inter-

fered with, and disease of the heart or of the lungs is the probable and frequent result.

I am quite aware that all which could be written on this subject would not cause stays to be disused; indeed habit may be said to render them almost a necessary part of female dress. But, as a sort of "forlorn hope," I would beg to give the following suggestions. Let not stays be worn until as late an age as possible; certainly not before twelve or thirteen years old. The older the individual the less soft, the firmer are the ribs, the less apt to be materially bent by moderate pressure. Let them be worn with as few, and as thin, and as yielding bones as possible, and, if it could any how be dispensed with, without a busk; let them always be laced loosely. Some at least of the evils of this practice will in this way be avoided, and the feelings of society not be in the least shocked by seeing women without stays. Stays are in fact useless; the spine wants no support. The way to make it want support is to support it; and in that way to weaken the muscles. The only possible end that stays can serve is to confine and give rigidity to the figure; an effect which would be produced, and produced without the ungraceful stiffness, which stays always cause, by a stout

linen or cotton undergarment, made to fit closely to the body. This would confine the figure and it would afford the pressure required; but the pressure would be equable, and it would be at no point unyielding; it would not weaken the muscles of the back, by affording a useless support to the spine; it would not interfere with the natural, abdominal respiration; it would not press undaly on the stomach; it would not deform the ribs, and so contract the cavity of the chest.

I have made an appeal to the common sense of my country-women; but habit and fashion are too firmly seated on their tyrant thrones to lead me even to hope that the appeal will be successful.

There are a few practical remarks, that must be introduced somewhere; although they may seem to be misplaced in this chapter. When in bed, all persons perspire much more than they do at other times; and this is the case to a greater extent, in direct proportion to the quantity of the bed-clothes, and the degree to which they and the bed are bad conductors of heat. There can, indeed, be little doubt, that many are lost to this world by an inattention to, or an ignorance of the great principle, that the

bed and the bed-clothes exhaust materially the vital powers. Everybody knows how essential are rest and quietude, and a total avoidance of all excitement, whether mental or bodily, to many cases of disordered health. The consequence is that many are ordered, under such circumstances, to lie in bed altogether. By and bye, treatment and time remove the inflammatory or active character of the disease, and considerable languor and exhaustion come on, or a high degree of irritability; and this is followed by great prostration of the vital energies: the symptoms become masked, the patient perhaps hopeless, and I do believe, that not unoften the patient sinks from these causes, and these causes only. How continually do we observe that patients progress very slowly in their convalescence, until they have left their beds, and have managed to recline, for a longer or shorter time, every day, on the sofa. How repeatedly does it occur, that the nights and days are alike sleepless, the bowels obstinately costive, all the secretions scanty, and the feelings depressed; until the patient is got out of bed an hour or two every day, and the vessels of the skin are relieved from the exhausting effects of the bed and bed-clothes.

While it is needful for every one to keep his surface warm in bed, yet this may be carried too far; or the necessity for more than a certain amount of such means may be materially diminished. A free and sufficient use of exercise, particularly walking, a regular exposure to the air, a daily change of air, and a regulated diet, are the great means of keeping the vessels of the skin in a state of efficient activity, and preserving or restoring the natural and equable temperature of the surface.

And, this point being gained, very few and light bed-clothes are all that are required; and the system, having been sufficiently exhausted of its vital energies by the day's work, needs no beds of down to lull it to repose, and a hair mattress, a sheet, blanket and counterpane will suffice to defend the body from the rude approaches of the cold air, even during sleep, and in the coldest of our wintry nights. Without such regular use of nature's opiates, the skin is easily chilled, and the body must be buried in a soft bed, and covered with heaps of bed-clothes; and then the skin becomes hot, the system feverish, the sleep disturbed, and the man rises unrefreshed, unable to prosecute his studies or his business. The system is perhaps relieved for

the time by medicine; until, too often so treated, the constitution becomes injured, or, it may be, is eventually broken up. I would not be understood to advise every reader to abandon at once without preparation, whatever his age, ailments, or habits, the bed of feathers, or of down, and the three or four blankets to which he may have been accustomed. Let the doing so be prepared for by regular diet, exercise in the open air, judicious clothing, &c.; and then, gradually, let blanket after blanket be dispensed with, and, last of all, let the mattress be put on the bed, instead of the bed on the mattress.

But, however great may be the caution needful with regard to the debilitated adult, very little such caution is necessary with the young. Children during the first months of infancy require much fostering heat; but this is seldom the case after the first six months of life. I would, then, by good nursing, by daily exposure to the sun and air, by the liberal and daily application of tepid water (temperature 80°) to the whole surface, by keeping the stomach free from all trash, as sugar, &c., regulate and give tone to the several functions; and, it may

be relied on, that no heating bed will they require, no multiplicity of bed-clothes will they need, and a hair-mattress and a blanket will suffice to keep up the heat of their surface, without irritating or weakening the system. Used to this state of things, and impressed from early years with a sense of its importance to their health, children would grow up hardy and strong, would be far less likely to be the ailing, puny, sickly creatures, that so often meet the parents' anxious eyes, and torture their feelings.

The *colour* of clothes greatly influences their warmth. To the reader who is ever so partially scientific, this will require no explanation; to the many, however, an explanation of it may possibly be necessary. It is a fact well known and incontrovertible, proved by direct experiment, that substances part with their heat to colder bodies, not only by *contact*, but in *rays*, proceeding from all points of their surface, in all directions. This is called radiated heat, and the bodies are said to part with their heat by radiation. Now it has been found, not only that different substances part with their heat in this way, with different degrees of quickness; not only that the quickness differs according as they

are more or less thick; not only as their surface is more or less rough; but that they part with their heat by radiation with different degrees of quickness, according as their *surface* is of this colour or that. Thus *white* substances both radiate most slowly and absorb radiant heat most slowly; *black*, on the contrary, both radiate most quickly, and absorb most quickly. The practical deductions from these facts hardly need pointing out. In hot weather it is important to wear clothes which will absorb as few of the sun's rays as possible: white garments are then the best. In cold weather it is important to wear clothes which will part with as little as may be of the heat of the body by radiation; white garments are the best in this instance likewise. The professional man clad in black is, strange to say, the most unphilosophically dressed; for in the summer his clothes, by absorbing to a great extent the sun's rays, render him much hotter; and in the winter his clothes, carrying off by radiation much of his heat, render him much colder, than would clothes of any other colour. The consequence is, that the delicate and the invalid should generally prefer white, or light coloured clothes, whether as summer or winter wear; and as winter clothing the

light coloured great coat is very much warmer than one of a darker hue*.

* As it is not unoften important in a sick room to keep liquids warm as long as possible, it may be well to mention, that colour, and surface, and material, exert considerable influence over their rate of cooling. Thus, if *polished* metal radiates only as 1; the same metal *tarnished* will radiate as about 2½; while earthenware vessels will radiate still more quickly. All vessels in which fluids are wished to be kept some time warm, ought to be made of metal and the surface of the metal ought to be kept perfectly bright; or what would be still better, as metals are good conductors of heat, and so part readily with their heat by contact, to have such vessels made of earthenware, and coated with highly polished metal. Earthenware is a bad conductor, the polished metal a bad radiator; and, therefore, in such a vessel any thing would be kept much longer warm, than in a vessel of any other kind.

CHAPTER V.

"I verily believe a cold bath would be one of the most healthful exercises in the world, were it made use of in the education of youth. It would make their bodies more than proof to the injuries of time and the weather. It would be something like what the poets tell us of Achilles, whom his mother is said to have dipped, when he was a child, in the river Styx. The story adds, that this made him invulnerable all over, excepting that part which his mother held in her hand during this immersion, and which by that means lost the benefit of these hardening waters."

GUARDIAN, No. 102.

ON the propriety of regular and frequent ablution as a means of cleanliness, it is needless to enter in this work. But I have set apart this chapter to a consideration of the physiological effects of water, whether applied to the surface of the body, or taken into the stomach.

It will be necessary to premise my observations on the effects of water applied to the surface, by some short account of the skin itself.

The skin is to be regarded, not only as a covering to the body, as a protection to the

softer, and more delicate, and more sensitive structures placed beneath it, but as being also intended to subserve many other offices no less important, although some of these offices will possibly be now first made known to the reader. The skin is constantly performing, as I have already had occasion to mention, the necessary function of expelling a considerable portion of the residue of nutrition and digestion. "To man," says Bichât, "it is a sensitive limit placed on the boundaries of his soul, with which limit exterior forms incessantly come in contact, to establish the connexions of his animal life, and thus bind his existence with that of all that surrounds him*." Eminently a bad conductor of heat, it maintains the elevated temperature of the body by confining its heat, and prevents external heat and external cold from necessarily and at once destroying life. Protected by this power of resisting the passage of heat, life continues under the severest cold, and is able to endure, with comparatively little inconvenience, almost incredible elevations of temperature. Supplied with an enormous amount of nervous filaments, to endow it with sensation, it not only acts as the sentinel against danger, as the mind's

* Bichât's General Anatomy.

ready and most accurate informant on all points connected with external things, but it is a ready means by which the mind may be made to endure extreme suffering, and the sensorial functions be materially and directly injured: it is a ready means by which the nervous system may be soothed, quietude and tranquil feelings brought back, and even cheerfulness and mental acuteness substituted for melancholy and mental torpor. Furnished with a vast amount of blood to supply its own substance constant renewal, to supply to its secreting organs, and to keep up the energy and healthiness of the nerves, which are dependent on the supply of blood, the skin is to be looked upon as an important organ by influencing which a very large quantity of blood may be suddenly thrown into the system, and there, in an incredibly short time, produce perhaps irreparable injury; as an organ, by attract the blood to which, the internal organs may be relieved at once from a load of blood, and enabled to resume the performance of those natural and necessary functions which it is their business to discharge, and which that gorging of the vessels had interrupted. When it is considered that, probably, the extent of the skin in a man of ordinary size is not less than 2500 square

inches*, we could scarcely wonder at any, however extravagant, estimate of the quantity of blood which it always, when healthy, contains; we could scarcely feel surprised, if we were told that it contains more nervous matter than that which forms the brain, or the spinal marrow.

The skin, properly so called, is covered by a much thinner layer, called the cuticle,—a layer which may with little impropriety be called inorganic; a structure which is destitute of nerves or blood-vessels, without feeling, or sensation of any kind, and, in fact, without life. This structure is then intermediate between the body and external objects; it protects it from being irritated by contact with those objects, without preventing it from feeling them. This is not renewed in the way that other parts of the body are, by absorption of the old and deposition of new particles, but by a constant deposition of small scales, or powder, the particles of which adhering to the subjacent surface and to each other constitute the cuticle. By friction these are partly rubbed off, likewise by ablution. If neither rubbed nor washed, the deposition going on, these scales or particles accumulate and

* "The Principles of Physiology," &c. By Andrew Combe, M.D.

form a thick crust on the outer side of the cuticle, a fact of which any person who has neglected to wash his feet may ready satisfy himself.

Under the cuticle, between it and the skin, is situated what is sometimes, but, as it would seem, erroneously, called a coat or layer, the rete mucosum,—a net-work of vessels of excessive minuteness; a net-work which, according to Bichât, consists of two distinct sets of vessels; the one containing colourless fluids which set supplies the exhalants, and consequently produces the perspiration; which, although usually filled with colourless fluids, may, by excitement of the heart's action, by exercise, or emotions, or passions, or by exciting the vascular action of the part by friction, be filled with red particles, with blood, as after running, as in blushing, &c.; and another set, in which there is always a languid circulation of fluids, those fluids being of different colours in the different races of men—black in the negro, white in the European, &c. Well; this delicate net-work, whose important effects I shall presently have to enlarge upon, is penetrated by papillæ, which come into contact with the cuticle, and are the seat of touch; these papillæ arising from the

skin; which, a highly vascular and nervous structure, flexible, elastic, and contractile, is loosely connected to the subjacent textures by cellular tissue; the interstices between those textures being more or less filled up with fatty matters, give roundness, and smoothness, and contour to the form.

After this brief, but perhaps sufficient notice of the structure and functions of the skin, I shall shortly notice the effect which temperature produces upon it.

Warmth at first increases the action of the vessels of the skin, causes a more considerable efflux of perspirable matter; the skin is sensibly reddened; and, if the heat is increased still further, inflammation, blistering, contraction, wrinkling of the tissue, and blackening, with disorganisation, ensue.

Cold at first stimulates the skin—reddens it; continued, the vessels contract, the rete mucosum no longer circulates its fluid, perspiration is no longer evolved, the skin becomes pale, and if the cold is increased in intensity, loss of feeling and death of the part, if not of the individual, ensues.

This supposes that the individual does not change his medium, that the skin is still sur-

wounded with air. The effect of water is somewhat different. If the body is in a state of vigour, and in full possession of its heat, the skin being unchilled, the effect of immersion in warm water is much the same as that from moderate heat, applied in other ways, except that the breathing is somewhat more laborious, and that the skin more actively pours out its secretions. The effect of immersion in cold water, under the same circumstances, is at first a rapid chilling, varying in degree according to the powers of the system, the fulness or emptiness of the stomach, the previous heat of the body, and the temperature of the water. This, if all things are favourable, is speedily followed by a brisk re-action, the body rapidly regaining its temperature; and if now the person leaves the bath, before the heat has once again begun to diminish, and has his surface instantly protected with clothing, the consequent effects are a much increased action of the vessels of the skin, and a relative increase of the amount of its secretions, and a relative increase of its temperature.

This does not, however, include the whole difference between the effects of hot water and those of cold. The cold water not only clears

the surface of its scurf and of its unctuosity as thoroughly as the hot water does, but it has this further effect — the vascular excitement into which the hot water throws the skin, and especially the rete mucosum, is readily and easily checked by cold air, or any depressing influence, acting either on the heart's action or on the skin itself; whereas, the vascular excitement into which cold water throws these textures, is rather increased by cold air, is less liable to be materially or suddenly lessened by any depressing influence.

I have said that the first effect of cold water on the skin is that of rapidly chilling it. Cold water acts on its vascular system as a direct sedative, checking its circulation and stopping its secretions, and throwing a large quantity of blood on the internal organs. If the water is not extraordinarily cold, and the powers of the heart and arteries are in full vigour, they are roused by this sudden rush of blood into extraordinary exertion, and, driving the blood back again to the skin, cause its circulation to be resumed with even unwonted briskness; the warmth of the surface is restored, and re-action has taken place. This state of things will continue a longer or shorter time, according to

circumstances, and then the heart and the arteries become no longer able to counteract the cooling effects of the cold water—they are overpowered—and, no longer able to dispose of the quantity of blood, which the rapidly refrigerating powers of the water is constantly throwing back upon them, they become loaded with blood, their action becomes oppressed and less energetic, the skin is now once more chilled, its circulation is once again languid; shiverings, loss of feeling, stupor, and, the cause still continuing, death ensues.

I have said above, that in order to the heart and arteries being able to repel the blood again to the skin, which the immersion in cold water had thrown upon them, several conditions are necessary. I will now glance rapidly at each of these.

1st. The water should not be extraordinarily cold: this must vary according to the circumstances presently to be mentioned; but, generally speaking, the temperature of the water should not be lower than sixty degrees. The heat of the body being generally about ninety-six degrees, a bath, even at the temperature of eighty degrees, will usually at first feel somewhat cold to the bather. But it must not be

forgotten, that, provided speedy reaction does come on, and provided there is no organ or function in such a state as to be injured by the influx of blood, the colder the water, within certain bounds, the greater, and more genial, and more beneficial will be the reaction.

2nd. As to the length of time a person should remain immersed. The colder the water the shorter time should the immersion continue. It is seldom prudent to remain longer in a cold bath than ten or fifteen minutes. The invalid should hardly continue in it so long as that.

3rd. The effect will vary according to the degree of energy with which the heart and arteries are acting at the time. There cannot be a more dangerous nor more imprudent practice than cold bathing while the body is fatigued, no matter how, whether from excessive muscular action, or from heat; whether it be the consequence of high mental excitement, or of long-continued mental exertion, or loss of sleep, or however else brought about. The heart and arteries acting languidly—the cutaneous circulation being therefore feeble, it requires very little cold, or other depressing cause, to load unduly the heart and arteries, having already almost more to do than they can

perform without inconvenience; and in this case there is either no reaction, or the reaction is only partial. Long-continued shiverings, great prostration of strength succeed, followed perhaps by local determinations of blood, or by a generally disordered state of system, inflammatory affections, &c. I will illustrate this by the often-quoted case of the late Dr. Currie, as recorded by himself in his wonder-working book, the "Medical Reports." The case will, most probably, be unknown to the reader.

"On the first of September, 1778, two students of medicine at Edinburgh set out on foot on a journey, a considerable part of which lay along one of the rivers of Scotland *. They started by sun-rise, and proceeded with alacrity in the cool of the morning. At the end of eight miles they breakfasted, rested for an hour, and then resumed their journey. The day grew warm as it advanced, and after a march of eight miles more, they arrived, heated, but not fatigued, on the banks of the river above-mentioned, about eleven in the forenoon. Urged by the fervour of the day, and tempted by the beauty of the stream, they stripped instantly, and threw

* The Tweed. The journey was from Edinburgh to Moffat.

themselves into the river. The utmost refreshment followed; and when they retired to the neighbouring inn, this was succeeded by a disposition to sleep, which they indulged. In the afternoon they proceeded, and, travelling sixteen miles farther at a single stretch, arrived at the inn where they were to sleep, a little after sunset. The afternoon had been warm, and they perspired profusely; but the evening was temperate and rather cool. They had travelled for some miles slowly, and arrived at the end of their journey, stiffened and wearied with their exercise.

"The refreshment which they had experienced in the morning from bathing induced, however, one of them to repeat the experiment, and he went perfectly cool into the same river, expecting to relax his limbs in the water, and afterwards to enjoy profound sleep. The consequences were very different. The Tweed, which was so refreshing in the morning, now felt extremely cold, and he left the water hastily. No genial glow succeeded, but a feverish chill remained for some time, with small, frequent pulse, and flying pains over the body. Warm liquids and frictions brought on, at length, considerable heat, and towards morning perspira-

tion and sleep followed. Next day, about noon, they proceeded on foot, but the traveller who had bathed was extremely feeble; and though they had to perform a journey of a single stage only, as some part of it was difficult and mountainous, he was obliged to take the assistance of a carriage which overtook them on the road. It was several days before he recovered his usual vigour. — This relation will not, I hope, be deemed of the less authority because it is given by the person who suffered by his imprudence."

4th. The effect of immersion in cold water will vary according to the heat of the skin, to the vigour with which the cutaneous circulation is going on at the time. The hotter the skin— the greater the vigour of its circulation, the more safe is cold bathing. But it must be especially remarked, that this supposes the heat to be caused, not merely by the sun's rays, or any similar mere external heating cause, but to be partially produced, and such as might be almost accounted for by the energetic action of the heart and arteries; in fact, the hotter the surface of the body under such circumstances, the quicker the reaction. It is, therefore, not well to stand, after undressing, any long time

before plunging into the water *. Such a practice chills the body very much more, and in many cases renders bathing, which would be otherwise profitable and advantageous, absolutely unsafe.

5th. The effect of immersion in cold water will vary according to the fulness or emptiness of the stomach; according to the period of digestion; according to the facility of digestion. I have remarked in a former part of this work, that the stomach during digestion, and particularly during the first stages of digestion, is supplied with a very large quantity of blood. Bearing this in mind, let the reader think of what must necessarily be the effect of either warm or cold bathing, while the stomach is in that state; and more especially if the quantity of blood sent to the stomach is barely sufficient for the purpose of digestion; more particularly if the action of the stomach is weak or disordered. The quantity of blood, either directly or remotely directed to the skin by either warm or cold bathing, would lead the reader naturally to preconceive that a more or less severe fit of

* Currie's "Medical Reports."

indigestion would follow. But this is not the only risk which attends the practice of cold bathing under such circumstances: so large a quantity of blood being directed to the stomach, the whole energies of the heart and arteries are not at immediate command; the skin is chilled, and the blood thrown on the great vessels: these are unprepared to devote all their powers to the restoration of the circulation in the skin; diverted by the demands of the stomach and those of the skin, both duties are but partially performed, unless the powers of the system are very great, and quite unimpaired; and not only are the functions of the stomach interrupted, but reaction is not immediate, and much risk is run of causing a disordered condition of the whole vascular system, and local and perhaps serious disease.

6th. The effect of immersion in cold water will vary according to the state of the mind. The influence of the mind on all the functions of the body, and particularly on the heart, are well known to be great. The palpitation which attends excitement of the mind; the blush which accompanies a sense of shame; the pallor of the skin, and shiverings which attend fear; the local determinations of blood, as apoplexy, &c., which

so often follow violent passions, or severe mental exercise, are all demonstrations of this fact. If the mind is languid, debilitated, worn out, lethargic, desponding, the bodily functions are almost always disordered in their action; and the use of the cold bath will most commonly be attended with risk; it will not be followed by instantaneous and necessary reaction. The hot bath, in cases of this kind, by determining a a large quantity of blood to the skin, and so relieving the brain and the greater masses of the nervous system from a large amount of blood, is to be preferred in many such cases, and, as a means of temporary relief, is, in many of them, infinitely better than the major part of the remedies to which the student and the melancholic too commonly fly.

Many persons, it is well known, are much benefited by an occasional use of the warm bath, just before getting into bed at night; and the practice is not, under these circumstances, followed by any inconvenience; but if they use the warm bath at any other time, it is followed by a sense of chillness, and is not unattended with danger. This is attributable to two distinct but co-operating causes. 1st. The oleaginous secretion that is on the surface of the skin

is removed by the bath. 2nd. The cutaneous vessels are much excited by the heat of the water, and that excitement is often followed, especially if the system be weak, by corresponding exhaustion and depression; and during that state the circulation of the blood in the skin is easily checked by contact with the cold air: the blood is thus thrown upon the internal organs, and congestive or inflammatory disorders of those organs often ensue. It is then well, under such, and indeed under all ordinary circumstances, to use the hot-bath at bed-time, in preference to using it at any other period; for the bed and bed-clothes defend the surface from the cold air, until the oleaginous secretion has again been poured out, and until the excitement that the heat has produced has gone off, and the corresponding and resulting depression has likewise departed, and a natural and proper degree of vigour and activity of the cutaneous circulation has returned.

I have hitherto only considered the effects of *total* immersion in *pure* water. These effects may be, and are considerably varied by additions to the water of salines, &c; by only part of the body being immersed; and by the water

being merely applied to the body, either poured over it, or the body being sponged with it.

1st. The effect which the addition of salt to the water produces, is very decided; probably by its stimulating effects, by irritating the skin; but at all events, in some way or other, it assists the reaction. In other words, a system which would be depressed by immersion in merely cold water, in which reaction would not come on after such a bath, would be only momentarily depressed by immersion in salt and water, reaction coming on almost immediately thereafter. Hence many of the weak and invalided can bathe in sea-water, but cannot bathe in fresh water. Hence, in cases of dyspepsia and debility, it is usually advisable to add salt to the water: about half a stone of common salt to the ordinary sized bath, may perhaps be considered to be an average quantity.

2nd. If only part of the body is immersed. In this case the chilling is not so great. But, except as a means of ablution, partial bathing is not, under ordinary circumstances, of much service.

3rd. If the water is merely applied to the body. The shower-bath seems to chill even

more than the plunge-bath, but the reaction takes place much quicker; and therefore, in some cases, it is to be preferred. The shower-bath is a convenient mode of bathing,—one readily introduced into a house,—one in which, as I have just said, reaction soon follows; but it is certainly not comparable, as a remedial agent, to bathing by immersion, and should, in very few and rarely occurring cases, be preferred to it. Even in cases of head-affection, to which, of all kinds of cases, the shower-bath is generally thought to be best adapted, if the precaution were taken of dipping the head in cold water, and wetting it thoroughly before entering the bath, and frequently while in it, the plunge-bath is, I think, almost always the better.

There are few customs so conducive to health as sponging the surface of the body all over with cold water every day. From this the chill, unless at first, or unless the system is debilitated, is trifling, the reaction instantaneous, and the benefit, I am satisfied, not to be credited until after trial. I have said that the skin is constantly secreting a fluid called perspiration; but besides this, it is always covering itself over, when the system is in a state of

moderate health, with an unctuous or oily secretion, probably as a means of preserving its elasticity and softness, and of rendering it a still worse conductor of heat. Now this unctuous secretion is not like the perspiration, soluble in the air, but it remains on the skin, and mixing with the exfoliated scales, or particles of the cuticle, forms a crust over the skin, a crust partially, but only very partially, removed by the movement of the limbs and body, or by change of clothes. This crust not only irritates, more or less, giving rise to many indescribable, and perhaps highly injurious, and certainly very annoying feelings of uneasiness and discomfort, but it actually interferes with the proper and adequate exercise of the functions of the skin. Sponging the surface removes these unctuous and scaly particles, frees the skin from sources of irritation and incumbrance, and enables its functions to be discharged without impediment. If this were the whole advantage which attends the practice, it is probable that enough would have been said to make every thinking reader adopt it; but this is not all the good which the regular use of cold water, as an external application, involves. No matter how used, whether by sponging, or

the shower bath, or immersion, cold water excites the action of the vessels of the skin, gives them tone, enables them to resist the influence of the ordinary vicissitudes of the weather, and thus wards off disease to a very remarkable extent.

If sponging with cold water alone produces too great a chilling of the surface, is not followed by brisk and speedy re-action, vinegar, or, better still, salt may be added to the water, in the proportion of one part of vinegar, to three or four parts of water, or a pound and a half of salt to the gallon of water*. If even this is not followed by quick re-action, if the system does not readily recover its warmth, a little warm water may be added at first, gradually adding less and less warm water to it, until it is brought down to cold.

Another practical fact must be mentioned. The skin is covered over with an oily secretion, which subserves many important ends, not one of the least of which is to increase the non-

* I am in the habit of ordering four or five pounds of salt to be dissolved in a bucket full of water, and placed in the bed-room or dressing-room, and this to be changed once or twice a week. This will be found to be often enough, and the convenience is so much greater than making every day a fresh solution of salt.

conducting powers of the skin, in defending the body from the effects of an elevated temperature, and in checking the evolution of its heat, when it is placed in a temperature lower than its own. One necessary effect of sponging the surface is to remove this oily secretion, and the skin is therefore not so protected, until the oily matter is again evolved in sufficient quantity to cover its surface. This, if the man is in perfect health, and in full possession of his powers, takes place in a very brief space of time; but if the person is out of health, his secretions irregular, and his system debilitated, it will probably be several hours before it is accomplished. Under such circumstances the sponging should be used only at night, just before, or even after getting into bed, for the body is then protected by the bed and bed-clothes from the influence of the cold air, and in the morning the skin is once more covered with the oily secretion, and once again prepared to come into contact with the cold air without risk.

While on this subject I will just allude to the practice, in which many unthinkingly indulge, of washing themselves, particularly during the winter months, in warm water. There are few habits which so predispose the system

to suffer from the effects of cold. I have traced many cases of frequent sore-throat to this practice alone, and their recurrence has been prevented by simply washing the face and neck with cold, instead of warm water.

Friction alone is generally a useful and advisable and energetic means of giving vigour, activity, and tone, to the vessels of the skin. The flesh-brush furnishes us with the best means of using the remedy; and a remedy it is in many cases of lingering disease, or protracted convalescence, or where, as in spinal cases, muscular exercise is not to be obtained. As an adjunct to bathing, the shower-bath, or sponging with cold water, friction is invaluable; every bather ought invariably to resort to it as a means of accelerating the re-action, and increasing it in degree: the towel with which he dries his skin can hardly be too rough.

I have now to speak of the effects of water taken into the stomach. They are in many respects, in what may justly be considered a great number of respects, analogous to those which it produces on the skin, or on the system when applied externally.

We have seen that *hot* water applied to the skin, stimulates it at first, but that the degree

of excitement is easily lowered by any depressing influence, as cold, or damp. The same is true with regard to hot water used as a drink. It stimulates the stomach in a very decided manner, but the stimulation soon passes off, and is followed by more or less languor or exhaustion of its powers.

The hot bath used habitually enervates, and weakens the powers of the skin, the tone of its vessels. So in the stomach, hot water, used habitually as a drink, debilitates its powers, and materially and seriously impairs its energies.

Again, we have seen that the cold bath, or sponging the skin with cold water, gives tone to the skin, strength to its vessels, energy to its functions. So in the stomach, cold water is an undoubted tonic, one which, used at proper times, and with proper precautions, is a valuable remedy; a remedy, the value of which has been much overlooked both by the public and the profession.

Again, when the energies of the body have been exhausted, no matter how, we have seen that the cold bath is generally injurious; depresses to an extent which the heart and blood-vessels are not in a state of sufficiently vigorous action to counteract. So in the stomach, in a

similar state of system, when the bodily powers are exhausted, copious draughts of cold water are often highly detrimental, and have even destroyed life; for it must be recollected that if a man in a state of fatigue plunges into cold water, and so unduly chills the surface and depresses the powers of life, heat may be applied to the skin, frictions may be used to any extent—means of at least partially counteracting the bad effects are at hand and applicable; but if the powers of the stomach are unduly depressed by cold water, its energies are not so easily restored,—warmth and friction are almost, to an equal extent certainly, out of the question. There is, however, but little doubt that few better means could be devised for it, than the immediate application of warmth to the region of the stomach.

Again, we have seen that although the skin is hot, the cold bath may be used, provided the powers of the system are not weakened, provided the heart and arteries are acting with full and proportional vigour. So, even although the system is hot, cold water may be taken into the stomach without risk, provided the bodily powers are in full and vigorous action.

Again, it has been remarked, that where

the powers are in such a state of comparative exhaustion, as that the cutaneous circulation would be injuriously depressed by immersion in cold water; yet that sponging with cold water is frequently not only not injurious, but even really beneficial. So in the stomach, when the system is in such a state of exhaustion that a copious draught of cold water would seriously depress, and perhaps sink the powers of life, slowly sipping the water, taking it by degrees, and little at a time, into the stomach, is usually a means of refreshing and re-invigorating it, and bringing back its tone and its powers.

CHAPTER VI.

"Monsieur!" said he, (for he speaks a little French), "Monsieur!" he repeated, "à six heures du matin vous prendrez à la Pauline trois verres! trois verres à la Pauline!" he repeated. "A dix heures vous prendrez.... (he paused, and after several seconds of deep thought, he added) encore deux verres, et à cinq heures du soir, Monsieur, vous prendrez.... (another long pause) encore trois verres! Monsieur! ces eaux vous feront beaucoup de bien!"—*Bubbles from the Brunnens of Nassau.*

THE subject-matter of the last chapter very naturally leads me to speak of the mineral waters; I say *naturally* leads me to speak of them, because more of those effects depend upon the powers and the temperature of the water itself than is commonly supposed.

Mineral waters constitute a subject of great importance, one which is yearly becoming more and more matter of interest, one which is every year more and more highly estimated, and it well deserves an elaborate and lengthened

notice, a space which I am unable to devote to it; yet not to mention them at all might justly be considered to be the effect of ignorance or oversight; and even the hasty notice which I shall give of them may perhaps be of use to some of my readers.

Mineral waters may be classed in two ways: *i. e.*, according to their constituents, and according to their temperature.

Under the first of these ways, mineral waters may be divided into salines, chalybeates, saline chalybeates, acidulous or carbonated, and sulphureous.

The saline mineral waters may be said to agree in their properties, all of them being more or less purgative. They differ from each other chiefly in the kind and the proportion of the salts which they contain.

It may be stated that the saline mineral waters consist, for the most part, of either sulphate of magnesia (Epsom salts), or sulphate of soda (Glauber's salts), united with chloride of sodium (common salt), and sulphate of lime (gypsum, or plaster of Paris).

Leamington is chiefly celebrated for the purely saline mineral water which its wells afford. The composition varies in the different

wells; but it may be said to contain sulphate of soda and chloride of sodium. Its action is aperient. Some of the springs contain more or less of iron.

Leamington is well known to be situated near Warwick, at a distance of perhaps a mile and a half. The country around it is flat, but highly cultivated. The town large, abounding in gaieties and amusements, and in all sorts of valetudinarian resources.

The waters of Cheltenham bear a very strong analogy to those of Leamington. Some of the springs contain, however, more sulphate of magnesia, and none of them contain more than a trace of iron.

Cheltenham is well sheltered by hills, its soil is dry, and even sandy. It deserves its celebrity.

The waters of Scarborough owe their powers to sulphate of magnesia and chloride of sodium.

Scarborough is on the coast of Yorkshire. It furnishes a pure saline mineral water; it is serviceable to those who are advantaged by a situation on the coast; while Cheltenham and Leamington are best suited to such cases as would find such a situation too bleak, &c.

These, with the addition of that at Harro-

gate, are the principal saline springs in England.

Scotland furnishes three principal saline springs: Pitkaithley, Airthrey, and Dunblane. These seem to be especially remarkable, from containing neither sulphate of soda nor sulphate of magnesia, their aperient virtues chiefly depending on common salt.

Seidlitz is about nine miles from Prague, in Bohemia; its waters are the strongest of the many mineral waters with which Bohemia abounds; they are bitter and saline to the taste; they act as aperients, owing their properties to the Epsom salts which they contain.

Chalybeate mineral waters occur very commonly in coal and iron-stone districts. There are several in and about Chesterfield; but these have for many years been, strange to say, hardly at all used. The principal mineral waters of this description are, in England, those of Tunbridge and one of the wells at Harrogate; in Scotland, "the Moffat water" and the "Vicar's Brig Chalybeate."

Chalybeate mineral waters owe their virtues to the presence of either the oxide, or the carbonate, or the sulphate of iron; in their action they are tonic. To the Moffat water I will

direct the reader's attention, on account of its remarkable strength. The following is the analysis given of an imperial gallon of it by Dr. Thomson, of Glasgow:—

	Grains.
Sesquisulphated peroxide of iron	591·025
Sulphate of alumina	112·726
Uncombined sulphuric acid . .	5·202
	708·953

This is almost too strong for even diluted exhibition internally; but the "Vicar's Brig Chalybeate" is said to be about four times its strength, and is, perhaps, the strongest chalybeate water in the world.

The celebrated waters of Spa are chalybeate. The number of springs is perhaps hardly known, but there are seven which are famous and much used.

Of the sulphureous springs, those of Harrogate are the most highly esteemed, and the best. Harrogate is situated on the south-western extremity of Yorkshire. It is a place which is very rapidly on the increase, chiefly on account of the power and the various properties of its

wells; it possesses sulphureous springs, chalybeate springs, saline springs, and a spring called from its properties "the Cheltenham Spring," which is an active and most excellent saline chalybeate: it is, however, chiefly as furnishing the sulphureous water that Harrogate is famous. I would only say that these waters are much abused. Many go to watering places who want change of air and scene, &c., but who do not want mineral water of any kind, and who take them from the absurd notion, that what does good to others must do them good; or from the equally ridiculous and thoughtless form of words, "I will, while I'm about it, get all the good I can." Such persons may sometimes take with impunity a common weak saline water; but let them beware of chalybeate, and, above all, of sulphureous mineral water! In fact, the latter ought not to be used from any written code of rules, but every person ought to take them under the express guidance of a medical man. This I know to be a thing *comparatively* unattended to by the visiter of Harrogate. Inattention to it has often led to serious results.

In Scotland, the principal sulphureous springs are those at Moffat, Strathpeffer, and Rothsay.

There is likewise an excellent, although, I believe, but little used well near Edinburgh, called St. Bernard's Well.

There are, of course, sulphureous waters on the Continent; but as Englishmen can drink them better at home than abroad, I pass them over without further remark.

There is one exception to this sweeping assertion. The springs of Aix La Chapelle, are, without doubt, the most celebrated sulphureted waters in the world. They combine the advantage of a high temperature ($135\frac{1}{2}°$), with that of being, perhaps, six times as strong as Harrogate or Moffat water. Aix La Chapelle is situated about seven miles from Spa. It is a town of considerable importance. Its waters are chiefly used as baths; and are much celebrated for their efficacy in diseases of the skin.

The next variety to be noticed is the acidulous or the carbonated: those which are charged with more or less free carbonic acid, owing to it their principal properties; or those whose virtues chiefly reside in an alkaline carbonate.

Of this class only one has hitherto been discovered in Britain; it is at Ilkeston, in Derbyshire, about eight miles from Nottingham. This water has only of late attracted any notice; indeed it is of recent discovery. It would seem

to be a tonic, and its properties and effects appear to be like those of the alkaline carbonates: it is aperient, &c. It has been spoken of, and a preparation called the "Concentrated Water" has been a little used in the neighbourhood of Chesterfield; but it does not appear to have attracted the notice, nor to have been used to the extent that might reasonably have been, *à priori*, anticipated. For a very excellent monograph on the Ilkeston water, I would refer the reader to that by Mr. Greaves, of Nottingham; it will richly repay a perusal.

The waters of Pyrmont, of Pouges, of Mont d'Or, of Vichi, &c., are all of this description; but that of Seltzer, or Selter, is by far the most celebrated of the acidulous waters; it is a saline alkaline carbonate, highly charged with free carbonic acid. "The best analysis," says that most amusing of travellers, the '*Old* [?] *Man*,' from the "Brunnens of Nassau;" "the best analysis I can offer of the Selter's water, is the plain fact, that the inhabitants of the village, who have drunk it all their lives, are certainly, by many degrees, the healthiest and ruddiest looking peasants I have anywhere met with in the dominions of the Duke of Nassau *."

* "Bubbles from the Brunnens."

The warm springs, or hot springs, may with every justice be classed by themselves, as their virtues and effects depend principally, if not entirely, on the temperature of the water.

Derbyshire contains two places remarkable for water, the temperature of which is elevated—Matlock and Buxton. I shall be excused for mentioning them first: most persons have a leaning to that which is nearest to their home.

Matlock is one of the most beautifully situated, the finest, and most really picturesque places that it has ever been my lot to see. Almost surrounded, and certainly protected on two sides, by high and abrupt limestone rocks, Matlock bath is placed probably rather more than two-thirds down the rocks on one side; and at the bottom runs the Derwent, here a pretty stream, bearing pleasure boats, &c. for the recreation of the visiters. The hills are covered with verdure, and the lower parts especially are richly wooded. One of the chief features of Matlock is the caverns, partly produced by nature, partly by the search after lead ore, spar, &c. But I must not forget that this work is neither to be entitled nor to be considered a description of Matlock. The leading feature of Matlock to the invalid is its sheltered situa-

tion; the air is, however, on the whole, damp. This may be an objection, and it may not. The temperature of the waters is probably about sixty-eight degrees; they form a very delightful bath, for which purpose these waters are principally, if not solely used.

It was my fortune to see Buxton, for the first time, after riding twenty-four miles, the greater part of the journey having been performed in the heat of a summer's day. I dismounted, and in less than five minutes was in the act of undressing for a plunge. The baths are fitted up with very great neatness, and are lined with white porcelain. Water is constantly running through them; no small advantage to the man of nice and refined ideas. Perhaps the best thing that I can do is to state briefly the effect which the water had upon myself. On plunging into it the shock was unusually severe, greater than I ever experienced in ordinary cold bathing; of course greater than I ever felt from bathing in the sea: and this is not a thing peculiar to myself, but I believe the usual effect that these waters produce. Reaction, however, came on much quicker than is usual with me in cold bathing; and this was followed, in about ten minutes, by all the luxurious languor which

the warm bath produces. This increased until I left the water (in twenty minutes), when, expecting to find my skin easily chilled, as it usually is after warm bathing, I was agreeably surprised to find it all in a glow, my strength recruited, my spirits even buoyant, and my appetite voracious. I trust this little bit of egotism will be pardoned, for really so few, except those who go to a watering-place, know anything of its effects, that it may be useful.

Buxton is barrenly situated, and still shows evident signs of having been, till very lately, a somewhat insignificant village. The present munificent and princely Duke of Devonshire has, however, altered this state of things; he has erected a very chaste and beautiful crescent, and in many other ways has contributed to its appearance as a town, to its comforts and necessities as a watering-place. Buxton is chiefly celebrated for its baths. Their effects on many individual diseases are surprising; but into such detail I must not enter. To all invalids, however, whose cases require a course of temperate bathing, combined with the advantage of a change to a rather bleak, but bracing air, and all the attractions of a pretty little and well-frequented watering-place, Buxton will be especially serviceable.

Bristol has long been celebrated for its hot well. Having a temperature considerably lower than the waters of Buxton, it, however, contains a much larger quantity of salines, and is slightly aperient.

But the springs of Bath are those which, in England, stand first on the list of thermal waters. The waters of Bath are aperient, and from their temperature, cordial, and stimulating, and therefore suited to the debilitated invalid; they contain some little iron, which will contribute to these effects. As a bath, these waters are in high esteem, and are deservedly much used.

The waters of Carlsbad, of Baden, of Wiesbaden, &c., belong to the class of thermal waters. Some of these are at the boiling temperature (212°), but are cooled in their passage to the surface.

I would here direct the reader's attention to the tabular view of the compositions, &c. of some of the principal mineral waters*. I have adopted the tabular form, because such tables are not

* In the construction of these tables, and, indeed, for many of the facts mentioned in this chapter, I have been deeply indebted to an article on Mineral Waters in the "Cyclopædia of Practical Medicine," by Dr. Thomson, of Glasgow.

only extremely useful for reference; but are very comprehensive in the information they give. To those unaccustomed to tables of this kind, an illustrative remark or two may perhaps be useful. The chief aperient salts in mineral waters are Epsom salts, Glauber's salts, and common salt, not to mention sulphureted hydrogen, which is the principal agent in sulphureous waters. Well, suppose the question is mentally asked, Which is the strongest of the Leamington wells? In which is the amount of salines in greatest quantity? By referring to the column headed "total of saline constituents," the question is at once answered, and Mr. Smith's will receive the award. If the question is asked, Which of them is the most decidedly and strongly aperient? by referring to the columns headed "Glauber's salts" and "common salt," and comparing them, Lord Aylesford's will be found to be the most actively aperient. Again, is it asked, Which of them are chalybeates, or, in other words, which contain iron? by referring to the column headed "oxide of iron," the question is answered, as likewise the other question, Which of them is the most strongly chalybeate? Again, by such a table a ready means of comparing the waters of different watering places is

afforded, and so determining the choice of the invalid or practitioner as to which should be selected as most fitted to the case, as best adapted to its nature and stage, and to the idiosyncrasies of the sufferer's constitution.

It must, however, be admitted, that, notwithstanding the amazing strides with which chemistry has of late advanced, the mode of analysing mineral waters is still not without serious objections. The elementary constituents may be ascertained; the bases of the several salts, and the acids with which these bases are combined, are readily told; the proportions in which each of these exist in a given quantity of water, can be determined with surprising, if not absolute accuracy. But the mode in which these are combined in the water; whether all unite together to form a single substance, having numerous components, but uniform and homogenous properties, physical or otherwise; or whether triple salts are formed, these salts existing in the water, without disturbing or acting on each other, is a question which chemistry has yet to assure us of. But, nevertheless, the strength of a mineral water, its general properties, &c., may thus be told with tolerable, if not sufficient accuracy. The philosopher must

look forward with anxiety to the development of such mysteries as these; the chemist, with fond and trusting expectancy, must long to know their how, their why, and their wherefore; the medical man may perhaps be pardoned, if, accustomed to look up to the sciences as the great benefactors to his means of doing good, he should impatiently desire the shedding of a clearer and brighter light on such obscurities: but the public have little to do with this, further than being allowed to know that there are such dimly lighted spots in the highways and byeways of science; they must be content to drink mineral waters, resting satisfied with knowing that they are useful, and that they are drinking the one which is the most likely to do them good: and thus much modern chemistry pretends, and with good grounds, to be able to tell them.

It is a constant matter of surprise that so small a quantity of salts, or of iron, or of sulphureted hydrogen, should exert any influence over the system: even medical men sometimes say that it is incomprehensible. But the fact of the matter is, that medical men, in general, are otherwise employed than in investigating, or do not pay sufficient attention to, the agency

of small doses of medicines, and especially of saline and chalybeate medicines, on the system. I will venture to say that, cold water being admitted to be a tonic, its effect will be increased by a grain of sulphate of iron being divided into eight or even more doses, and given regularly every morning in the water for six weeks or two months. I have convinced myself from repeated trials, that thirty, or even fifteen grains of sulphate of magnesia, taken every morning in a large quantity of cold water, acts on very many—on the majority of people—as an aperient; and as an aperient without either debilitating the system, or weakening any of its powers, but with the opposite effect of giving tone to the stomach, energy to the chylopoietic functions, and vigour to the system. Much good has already been done by Dr. Wilson Philip's work on Minute Doses of Mercury; but the way is only entered upon, and the reason why it has not long been thoroughly beaten, is obvious enough. Patients apply to medical men when they are seriously ill, and the attendance is discontinued when they are said to be convalescent; or they apply to the medical man for chronic ailments, and too often, unless the medicine in a few days produces some

direct, appreciable, and almost palpable effect upon them, they discontinue it, and "try somebody else." The consequence of this state of things is—a state of things which it will be well for the public to put an end to as soon as possible—that medical men have been afraid, or have not dreamed of ordering any medicines which could not reasonably be expected to do something or other in a week, or at all events ten days; and thus the patient, instead of being gently and quietly brought back to health, is urged on hurriedly, and either gets better by comparatively violent measures, or, getting worse, discontinues the means. The reader may possibly say, however, that this sort of advice had been vastly better, and more appropriately addressed to the profession, than to the public. I take leave to differ from him. The professional man must be pretty sure of the absolute confidence, of the steady perseverance of a patient, before he would venture to say, "I must put you under a two months' or three months' course of medicine," or, "I am going to order you what possibly you may not feel any effect from for a fortnight or three weeks."

These remarks are earnestly urged on the attention of the public; are addressed with

humility, but with equal earnestness, to my medical brethren. Many readers, perhaps some medical men, may ridicule the advice; but there is one answer, of the truth of which I am satisfied: in chronic cases we strive to go too fast, and——but every one knows the fable of the hare and the tortoise.

Let me proceed, however, to still more practical remarks, or at any rate to remarks still more intimately connected with the immediate design of this work, and particularly of this chapter of it.

The great advantage in watering places of all sorts and descriptions, lies, in my opinion, first, second, third, and fourth, in a variety of of attendant circumstances, and, last of all, in the water. A man leaves his business behind him; he loses sight of his cares and anxieties; he changes his air; his habits naturally conform to those of the persons about him. He finds that others go to bed early, and so does he. He finds that others spend much of their time in walking, and so does he. He finds that others drink cold or cool water in the morning, and so does he. He finds that others are always thinking and talking of their health, about the digestibility of this or that substance, the pro-

priety of this or that dietetic regulation, and he treads in their steps. The creature of custom, he thinks like those around him; he gives attention to the same subjects; he goes to bed early; he takes a great deal of exercise in the open air; he more or less diets himself; and all this in order to take a few grains of salts, or a little iron, or some sulphureted hydrogen. Well! "Oh! it is the water which has worked such wonders." The regular hours, the restricted diet, the change of air, the exercise, the mental recreation, have, forsooth, done nothing, have contributed in no degree to these good results. But enough of this. I should not have said so much, however, for the sake of mere wordiness; let us, then, to its application.

There are numbers, hundreds, thousands of invalids in Great Britain, who cannot go to a watering-place. Have they within their reach, and within their power, any substitute for it? Is it not possible for them, without travelling, it may be one or two hundred miles; without going where every article of diet is taxed by Fashion—that royal dealer in exorbitant imposts; without perhaps beggaring his family to prolong his life, straitening his circumstances, or at all events inconveniencing them, to obtain health; is it not possible for him without this

to do something for himself similar to what a watering-place would do for him?

Can he not forego the cares of business without this? Can he not even enjoy change of air without this? Can he not have walking exercise out of doors without this? Can he not go early to bed, and rise early from it without this? Can he not have regular hours for his meals, and attend to his diet without this? Can he not drink cold water, or tepid water, or warm water, in the morning, without this? Yes! But still the saline, or the chalybeate, or both are wanting.

Now this is the point to which my observations have been for some time converging; to which I would wish to direct the poorer invalid's attention—the attention in fact of the greater, by far the greater majority of dyspeptics.

Salines, in the usual mode of their exhibition, act as aperients; but they do so with debilitating consequences, even if they do not irritate in their action. Chalybeates, in the usual mode of taking them, cannot, under ordinary circumstances, be persevered with, because they load the mucous membranes, and disorder the stomach. But this is not the case when they are taken in the state of mineral water. Well, let the invalid try what effect an artificial

mineral-waters will have upon him, on his stomach and bowels and system. This question, much as has been said about it from time to time, has never been fairly tried. A man has either taken too large a dose of the medicine, or he has not taken it in the proper manner, or at the proper time, or he has not used it long enough, or he has not accompanied the use of the means with the necessary, and I believe primary matters, things by the bye which are and must be attended to at a watering-place. Now, let it be remembered that I am not writing this for the benefit of those who can afford to go to a watering-place, I would not substitute my perhaps crude, but candid views for such a step, where it is compatible with necessary and proper considerations. I am only writing this for the benefit of those who either cannot, or ought not, to go to such places, or who may hardly think so decided a step necessary.

Supposing a pure saline to be the thing wanted, let a scruple or half a drachm of Epsom salts be dissolved in half a pint of water, and taken the first thing on getting out of bed in the morning. Then let the individual walk for half an hour, weather permitting, in the open

air. Then return home, and if he feels as if the stomach would bear it, let him drink another half pint of water by itself, and then sit and read or write; or, if quite untired, walk gently for another half hour, and then breakfast. If he should find that even after two or three mornings the water still somewhat nauseates, let him add about a third of a bottle of soda water to the first, or saline glass of water. If inconvenience is still felt, let him take the dose about two or three hours after his breakfast, using the same means after it.

These observations are equally applicable to saline chalybeates, which may be made of the same quantity of salts, with either one-fourth of a grain of sulphate of iron, or, what is probably better, two drops of the muriated tincture of iron*.

This will probably be considered to be an

* The way in which I am in the habit of ordering these things, of which I am only afraid of *seeming* to say, not afraid of saying too much, is this:—to make a saline chalybeate, put two ounces of Epsom salts into a wine bottle, add a drachm of the muriated tincture of iron, and fill the bottle up with water. Of this let two table spoonsful be taken in half a pint of water, and let the quantity added to the half-pint be increased or diminished according to circumstances. The saline water is made in the same way, without the iron—the chalybeate in the same way, without the salts.

unchemical mixture; and most evidently a considerable portion of the iron is in a few days deposited in the form of red oxide. The idea, however, was borrowed from the analysis of mineral waters, and so many seemingly unchemical mixtures are serviceable, that it did not deter me from a trial of it. That iron still remains in solution is evident from the glow occasioned in the stomach after taking it—a glow much greater than would be caused by mere cold water; from the tonic effects of the water on the system, and from the *blackening* of the feculent discharges*. That iron remains is likewise shown by filtering the clear supernatant liquor through blotting paper, and adding a little tea, when a very copious black precipitate is produced. This precipitate is so much more copious than is generally produced by the same re-agent from chalybeate springs, as to lead men to think that even considerably less of iron might be added, and yet the water be anything but inert as a chalybeate. It should be borne in mind that much of the iron is deposited, or the dose will appear to be very much larger than it really is.

* All the preparations of iron, however exhibited, whether in the form of chalybeate water, or otherwise, produce this effect on the intestinal excretions.

If a pure chalybeate is wanted, a case which I certainly think to be comparatively rare, the same quantity and preparation of iron might be used as that I have last mentioned. But this ought probably always to be taken between breakfast and dinner, and exercise immediately thereafter is probably even more necessary in this case than the others.

It is probable that in all these cases the draught will, for the first three or four mornings, chill the stomach, and its quantity, perhaps, somewhat inconvenience it—even some little nausea may be induced; but if the use of salines, or chalybeates, or saline-chalybeates is proper, they will go off after three or four mornings.

I have said enough of mineral waters. Perhaps the enthusiastic advocate for them may think that they deserve to be placed higher in the scale of remedial agents than change of air, or attention to diet, or exercise, or regular habits, or early hours; another may perhaps think that they act in a way at once unexplained and inexplicable, and laugh at all attempts to substitute a diluted saline, or chalybeate, for the real and genuine concoction of nature. But time and observation are the only umpires in a question of this kind.

CHAPTER VII.

The shades descend, and midnight o'er the world
Expands her sable wings; great nature droops
Through all her works: how happy he whose toil
Has o'er his languid pow'rless limbs diffus'd
A pleasing lassitude; he not in vain
Invokes the gentle deity of dreams:
His pow'rs the most voluptuously dissolve
In soft repose; on him the balmy dews
Of sleep with double nutriment descend.

ARMSTRONG.

Leves somni, laboris, virtutis, temperantiæ, præmium et solatium, immerentibus haud facile conceduntur.—*Conspectûs Medicinæ Theoreticæ, a Doctore Gregory.*

The next, and indeed last subject for observation in this work, is the important one of SLEEP. It may seem to be somewhat out of place; but the latter chapters have been so necessarily connected that it could not be previously introduced.

The philosophy of sleep presents a most interesting subject of inquiry; one which is alike

within the limits of the moral philosopher, the physiologist, and the physician. It is chiefly in the latter point of view that it will be regarded here.

Sleep is that state in which there is neither sense nor voluntary motion; in which the mind is relieved from its toils, its thoughts, and its cares—the body from its labours; in which there is no consciousness, the only signs of life being the continued performance of the organic functions.

The brain and nervous system may, without giving much room for disputation, be said to have three sets of functions to perform; or, rather, to be the medium through which the invisible and immaterial soul acts and manifests itself in three ways. The one of these is the high and abstract exercise of the intellectual faculties; the second, the influence of the will over the voluntary muscles; and the third, the by us unfelt, but still no less perfectly known influence which it exerts on the involuntary muscles, those by which we breathe, by which the heart and arteries are constantly acting on, and circulating the blood, by which the intestines are ever contracting, by which all the secreting organs are enabled to form their

various products. This last division is called organic; this exercise of the nervous system, this department of its functions is called organic life. In perfect sleep the whole powers of mind and body are at rest, the functions of organic life alone remaining to tell us that it is not death.

After a time, then, the cerebral and nervous power would seem to become exhausted; the mind and the muscles of voluntary motion are unable to continue the exercise of their functions; the muscles are no longer able to sustain the body erect; the head falls forwards, the limbs relax, the spine is bent, and, unless supported, the man falls to the ground, or he previously assumes the recumbent posture, that in which he is sustained with little or no exertion of the voluntary muscles. The mind meanwhile ceases from its labours, the faculties of judgment and memory and association, are one by one gradually suspended, and finally, imagination, the last to quit, the first to return to its post, leaves it; and the external senses, first sight (the eyelids have closed), then taste, then smell, then hearing, then touch, severally and one by one, cease their exercise; and—the man is asleep.

The rationale, or theory of sleep, is still a mystery. We do not know its immediate cause, the condition of the nervous system which it involves. It has been called a pressure on the brain. It has been attributed to a loss of irritability, to a temporary wearing out of the nervous influence. To the first of these, the answer of medical experience is ready and satisfactory. Compression of the brain invariably produces a stupor, and not sleep; it brings on a state, from which the man is aroused with difficulty, and only aroused to fall back into it the moment the exciting cause is removed; a stupor which is exhausting rather than refreshing, which reduces the powers of life rather than renews their vigour. The answer to the second is equally tenable and equally true. It cannot be owing to a loss of irritability, because it may be protracted to a degree beyond that which would suffice to restore that irritability, not a moment beyond which could it be prolonged, were loss of irritability the immediate cause of sleep.

A most beautiful and ingenious, but, I fear, an equally answerable, theory of sleep, has been propounded by Dr. Hibbert, in his interesting work, "The Theory of Apparitions."

It is said that in sleep the breathing is slower, less carbon is evolved from the lungs, and thus some of the compounds of carbon, as carburetted hydrogen, carbonic oxide, or carbonic acid, is accumulated in the blood, and being applied to the brain in the course of the circulation, throws it into a lethargic, inactive condition, which constitutes sleep; all these compounds being naturally and necessarily soporific. But supposing that this theory will answer all purposes provided the man is actually asleep, the natural question arises, How is he first rendered sleepy — how is he first thrown into slumber? Oh, says the theorist, the exhausting influence of the day's stimulation, the wearing-out effects of mental and bodily exercise, by reducing the irritability of the nervous system, bring the powers down to that point at which the stimulus of surrounding objects is only just sufficient to keep him awake, and the man is sleepy: and whether we add to the exhaustion by giving a sedative, or take from the stimulus by removing the influence of external objects, the effect is still the same, the balance is destroyed, the equilibrium overset, and the man sleeps. Now, before actual sleep, while the man is still only

sleepy, the compounds of carbon have accumulated in the blood, for the breathing has become slower; and these, acting as the sedative, destroy the equilibrium, and sleep is induced; an effect necessarily rendered more certain by a recumbent posture, which relieves the nervous system from the necessity of supplying the voluntary muscles with their stimulus; and by darkness and silence, which free the external senses from their wonted excitants. But how is it, if this is the correct rationale of sleep, that the man awakes again? Whence does it happen that this narcotic influence of the compounds of carbon is either stopped or counteracted? The theorist is ready with his answer. The nutritive process is busily employed during sleep, in repairing the waste caused by the exercise of the mind and the body during the previous waking hours; in restoring vigour and irritability to the nervous system; and this once restored to a certain point, the narcotic and sedative influence is more and more counterbalanced, the sleep becomes slumber, the voluntary muscles are somewhat excited, and the body becomes restless; the mental faculties resume, one by one, their activity; imagination begins to act, the senses to resume their labours,

and a dreamy, partial consciousness, the mixed up effect of imagination and the sounds or odours of external objects, contact with rough, or hard, or cold, or warm substances, in part felt by the touch, all constitute the morning dreams, which most men have more or less. At length the irritability is fully restored to the nervous system; and consequently the mental faculties, and the powers over the voluntary muscles and the external senses, are once again in full operation, and—the man is awake.

I have said that I fear this theory, which I have mentioned on account of its beauty, and because it explains a good deal, if it does not explain sleep, that I fear it is answerable. If it were the case that, other things being equal, a man always sleeps long and deeply in proportion to the exhausting influence of the previous day, then the theory might be admitted as probable, if not the solution. But it is not so. Sleep, its rationale and its cause, is still a mystery, unexplained, perhaps never to be explained by man.

We must be contented with knowing that sleep is a necessary rest to the mind and the body, required in direct proportion to the degree in which the one or the other, or both, have been

exercised; in proportion to the youth or advanced age of the individual: all these circumstances, however, being greatly modified by the habits, the constitution, the health, the food, &c.

The wear and tear of the mind equally requires the cordial and restorative powers of sleep, as does the wear and tear of the body. What is bodily fatigue, but exhaustion of the nervous influence with which the muscles are supplied? It is not that the muscular particles are worn away, that its fibres are injured, that its substance is lessened by the exercise. No! It is simply that the nervous supply of vital influence to the sets of muscles used is exhausted. So far indeed is it from being the case, that, by exercise of any muscle or muscles, their size and capabilities are diminished, that, by such exercise, if regular and continued, with sufficient intervals of rest, the calibre and powers of the muscles are prodigiously increased. Witness the brawny arms and chest of the blacksmith, the full and well-developed leg of the man who walks much, the gastrocnemii* in the opera dancer. The truth of the matter is, then,

* Muscles of the calf of the leg.

that the exhaustion produced by deep thought, by severe mental exercise, is much the same as that produced by bodily fatigue. Both are caused by abstraction and diminution of the vital influence; both are, in fact, directly and distinctly resident in, and connected with, the nervous system, although each is referrible to its own distinct department; and therefore, for the renovation of both, rest is required. Sleep is the natural cordial for bodily and mental exhaustion—a cordial which ought to be proportioned, in extent and duration, to the degree to which the bodily or mental exercise has been carried. But this neither can nor will be perverted into the notion, that by the above I mean that exercise of the body and exercise of the mind are at all synonymous; that their effects on the system are the same, or their influence on the health in any degree similar. Alcohol and opium are both, in moderate and small doses, stimulants; are both, in large doses, sedative; yet, not unoften, the one counteracts the influence of the other*.

* "It (opium) is employed by some of the oriental nations for the same purposes that we take spirituous potations: by the Turks especially, to whom our more generous beverages are prohibited by religious prejudice,

So exercise of the mind and exercise of the body, both bring on exhaustion—both equally require the refreshment of sleep; yet are their effects very different. They are both necessary, the one to counteract the influence of the other; the latter to ennoble the man, and fit him for his station as the highest, goodliest, and noblest animal in creation.

It is a common mistake to suppose, that if a man sits on his chair all day, or moves only from room to room, he cannot require the same amount of sleep that he would stand in need of were his limbs all day in motion, were his

opium is solicited to inspire courage, or to invigorate fortitude; to soothe sorrow, or to dissipate the remembrance of misfortune; to awaken the fancy to more brilliant exertions, or to create that mild composure and serenity of feeling, which is desirable after the cares and solicitudes of an active, perplexing, and arduous scene. Like spirituous liquors among other people, it is, in short, the support of the coward, the solace of the wretched, and the daily source of intoxication to the debauchee. Notwithstanding all this, spirit and opium are by no means parallel medicines; on the contrary, the latter substance offers the best remedy for the *ebrietatis potus* ("delirium tremens," or drunkard's delirium), and, in cases of habitual drunkenness from alcohol, where our wish is to abstract the spirit, but are, for obvious reasons, unable so to do, we may frequently alternate its use with that of opium, with considerable advantage.' — Dr. Paris's Pharmacologia, vol. ii. p. 356.

muscles engaged in active and laborious work. Not but that, if this is continued, and no bodily exercise taken, no change of air enjoyed, high irritability of the nervous system will come on, and sleep be either banished, or if not banished, will be imperfect. But if occasionally, in such comparative inactivity of all the voluntary muscles, the mind undergoes long and severe exercise, the man requires as much, if not more sleep, than if the body, and not the mind, had been at work. And if such an amount of sleep is not enjoyed, let the man pause, and ensure sleep by sacrificing some of his next day's moments to the exciting causes of sleep; or, ere long, his mind will be incapable of profitable effort; the tired steed will answer to the whip and spur no longer.

The period of childhood, while the body is still growing, requires much sleep; the youth less, the man less; the middle-aged seem to stand in need of a very small amount of it. As life wears on, more and more sleep is wanted; and a sleep only partially split into portions by dreamy intervals of imperfect consciousness, is the common attendant on protracted years.

Habit influences greatly the quantity of sleep that is required by men of any age, or engaged

in any occupation. I am not about to advocate the curtailment of any of the revenue that is justly due to the drowsy god. A man may use himself to so little sleep as to be thereby greatly the loser in his waking moments. This seems to have been little, if at all noticed; but it will be almost always found, that those persons who boast of spending no more than four or five hours in the twenty-four in sleep, devote a far greater portion of the day than their fellows to absolute mental and bodily inaction, to a state of dreamy and useless vacancy. I believe that, with every man, the hours expended in sleep, are not the only hours that might justly be taken from the sum total of his life, as having been virtually lost to it; but that, by us all, numbers of moments are daily spent in total inaction, whether of mind or body, and that sleep cannot be robbed of its dues without adding materially, and in greater proportion than the time taken from it, to that wasted in these waking reveries. In order that the mind may be able to undergo trying and exhausting labours; that it may be in full possession of its powers and capabilities; and, above all, that it may be able to continue such labours, and be kept undulled and unblunted by such wear and

such use, an amount of sleep must be enjoyed proportionate to the severity of the work, to the engrossing and absorbing nature of the mind's employment. A man may rob his nights of sleep, and devote those hours to study for a short time; but the time will be short. The mind and body intimately sympathise. The nervous system cannot be robbed of its sleep without having its functions disordered; and this, influencing the mind, will either incapacitate it for useful exertion, or will overset the just balancing of its faculties, and cause the imagination to outweigh the judgment; will impair the memory, and confuse the faculties of order and association.

I have said that the constitution of individuals modifies the amount of sleep that they require. The delicate-fibred, the feeble, and the nervous, the debilitated offspring of the sedentary, the debauched, the voluptuous, the sensual, the scantily fed, and the aged, will require more sleep than the muscular, rosy, and powerful, the unailing, vigorous child of the active, temperate, abstemious, somewhat intellectual, plainly but well-fed, and youthful.

It has been observed, that the health of an individual greatly modifies the amount of sleep

he stands in need of. The more weakly, the more languid, or the more irritable the person, the more important is sleep to him, and the more should he be allowed. The more lethargic, the more strong, the less irritable the person, the less sleep will he require, and the less ought to be taken by him. The kind of disease which may be present, as well as the peculiar condition of the patient, will very considerably vary the quantity of sleep that is necessary. This must, however, be left to the discretion and guidance of the medical man. Rules on this subject would be quite as likely to lead the wrong way as the right.

The food modifies the amount of sleep required. Animal food renders more sleep necessary than vegetable food; and it may not lead into error if I observe, that those persons who sleep much, too much in proportion to the exercise of body, or mind, or of both, that they take, and in whom it cannot be attributed to debility, or to actual disease, would do well to think whether it may not possibly be owing to the quantity of animal food which they consume; and if there is more or less reason for such an opinion, to try the effect of partially, or for a time, wholly substituting for an animal

a vegetable diet. The unnecessary indulgence in malt liquors, or in vinous or spirituous potations, especially when such is ventured on by the sedentary, is a common cause of taking too much sleep. This is truly stealing from one's days, the number of which is generally found to be too few for the discharge of the necessary duties of life, a large fractional portion of their hours, and recklessly throwing them into the waters of an unrequiting oblivion.

> Death, so call'd, is a thing which makes men weep,
> And yet a third of life is pass'd in sleep.
>
> BYRON.

Excessive sleep weakens and torpifies the body, prostrates its powers, enervates and disorders its functions. Its effect on the mind is no less serious. It stupifies the sensibilities, blunts the feelings, weighs down and blackens the imaginings, warps the judgment, and impairs the memory.

The time which should be devoted to sleep varies so much, that no standard can be adopted with regard to it; but seven or eight hours may perhaps be said to be the average time required for it.

It would be impossible for me to conclude

this chapter and this work in a more practical or useful manner, than by briefly mentioning the exciting causes of sleep and the exciting causes of wakefulness. These may be divided into those which are purely mental, those which belong to the external senses, and those which have reference to the functions of organic life.

1st. Purely mental causes. A moderate and adequate exercise of the faculties of the mind not only renders sleep more necessary, but puts the system into the state in which sleep is most likely to come on, and to be tranquil and refreshing. An immoderate exercise of those same faculties throws the nervous system into a state of almost morbid irritability; and so either altogether prevents sleep, or renders it uneasy, partial, dreamy, and rather exhausting than cordial—rather enfeebling than restorative.

Why rather, sleep, ly'st thou in smoky cribs,
Upon uneasy pallets stretching thee,
And hush't with buzzing night-flies to thy slumber;
Than in the perfum'd chambers of the great,
Under the canopies of costly state,
And lull'd with sounds of sweetest melody?
O thou dull God, why ly'st thou with the vile,
In loathsome beds, and leav'st the kingly couch,
A watch-case to a common larum-bell?

Henry IV. Part 2, *Act* 3, *Sc.* 1.

Anything subversive of mental tranquillity, the exciting or the depressing passions, as anger, fear, grief or joy; thoughts, cares, and anxieties; memory over-busy in recalling the past, especially if the picture it pourtrays is of a sad or darkened character; imagination busy in delineating a future, tinged with the reflected hues of its own chameleon and many-coloured surface, and especially if the tinge is of dark or sombre cast, drives away sleep; whilst tranquillity of mind is one of the best of sleeping draughts—is the surest and most effectual plea that can be offered in the court of Somnus.

2nd. The causes which belong to the external senses. Darkness favours, light is unfavourable to sleep. Hence the wisdom of devoting the hours of night to sleep, and rising with the sun to resume our labours; hence the beautiful construction of the eye-lids and eye-lashes to shut out the light, and protect this, the most sensitive, although perhaps not the most accurate of the senses, from these unwonted and injurious stimulations. Sounds, especially loud, harsh, discordant, irregular, and near, are great preventives of sleep; while such as are low, smooth, musical, monotonous, constant, and distant, almost always provoke it. Need it be said that

the hum of bees, the murmur of running waters, the swelling and falling tones of distant music, even the unvarying tones of a drawling speaker or reader, induce sleep. Need it be said, to prove that the sounds have had something to do with the sleep, that the person often awakes when they are discontinued. Certain odours, as that of freshly gathered flowers, particularly such as have a faint fragrance, rather than a powerful though pleasing perfume, have often been observed to induce sleep. Has it fallen to any reader's lot to sleep on a bed of heather? Is not the odour of the violet and the mignonette of this kind *? There are, however, many peculiarities in this respect; and I have reason to believe that some men are remarkably affected in this way by certain odours, other men by others. Touch, the last of the senses which surrenders to sleep, and the first to shake off its trammels, no doubt materially influences sleep or wakefulness. Contact with hard, or rough, or cold substances has sometimes the effect of inducing, but more commonly that of chasing away sleep.

* If the pillow filled with the petals of the poppy, that was in former days so highly esteemed as a mode of procuring sleep, has any power, must it not be referrible to this head?

But as it is in the organic functions alone that signs of life are left, when perfect sleep has locked up all the other functions of the nervous system; so it is in the organic functions that we must look for the principal exciting causes or preventives of sleep.

Digestion in its different stages, the circulation of the blood, the condition of the respiratory functions, the state and condition of the various secreting and excreting organs and tissues, all modify and influence sleep.

In the earlier stages of digestion, probably from the large quantity of blood that is then directed to the stomach, and perhaps from the large quantity of nervous power with which it would then seem to be supplied, the mental powers become comparatively more or less inactive, and the will to move more or less diminished. This varies much according to the quantity and the kind of food that has been taken, and according to the tone, the health, and the powers of the stomach and its glands. In the latter stages of digestion, on the contrary, some degree of buoyancy, aptitude for any or every kind of work, intellectual or bodily, comes on, to be followed by some degree of languor or restlessness, and that by

the appetite for another meal. "Then," perhaps thinks the reader, "would it not be well for me to sleep immediately after my meals, obey the dictates of nature and my feelings, and so allow the whole nervous influence to be directed to, and concentrated on my stomach and its labours; then to arouse myself, and read, or write, and exercise my mind with my business, and then to sit awhile before I eat the next meal?" It is a natural, but experience has shown it to be a hasty and wrong conclusion. It is admitted that sleeping, during the first stage of digestion, does accelerate and facilitate the digestive process; it is admitted that a man's digestive powers may be so weak, that, unaided by this, the stomach may not be able to digest even the lightest, and simplest, and smallest quantity of food; but, unless under some such circumstances, the practice unduly hurries the first stages of digestion, throws the food too soon into the bowels, and causes the ulterior stages of digestion to be prematurely and too soon brought about. "Its effect," says Dr. Paris *, "is to hurry on the latter stages of digestion; and hence the fever and state of excitement in which the person not

* Dr. Paris on "Diet," p. 299.

unfrequently awakes." There are, however, as I have already implied, cases in which the practice is anything but injudicious; but these are extreme cases. In general, simply sitting still is infinitely to be preferred, and much less objectionable. It may be mentioned, although rather out of place here, if, indeed, practical remarks are ever out of place, that the common practice of devoting those moments of buoyancy and vigour, which follow the completion of the first stage of digestion, to any sedentary occupation, is anything but an advisable practice for the dyspeptic. Those are the golden moments which should be given to exercise of the body, at all events once a day, and best in the forenoon, after the breakfast has ceased to depress the powers of life. There is a still further stage in which the food may be, and often is, troublesome to the patient, and in which, if it be so, it is the common cause, not of deepening, but of breaking up his slumbers; it is when the food has got into the lower bowels *. How many a dyspeptic awakes about two or three in the morning, restless, thirsty, the tongue parched, the skin dry, the soles of the feet and palms of

* Dr. James Johnson on "Morbid Sensibility of the Stomach," &c.

the hands burning hot, and, perhaps, as a prominent symptom, but more commonly as an obscure sort of sensation, an undue sensibility, or a degree of pain in the bowels? This is usually the consequence of some error in the previous day's diet; in general, of something that has been injudiciously eaten at supper.

> Oppress not nature sinking down to rest
> With feasts too late, too solid, or too full.
>
> ARMSTRONG.

In the circulation of the blood, the cause of sleeplessness and of oppressing, overpowering, and enfeebling sleep, is very commonly to be found. If blood is driven with unwonted rapidity through the vessels of the brain, restlessness ensues; if that rapidity is still further increased, that restlessness passes into profound, exhausting, and lethargic sleep. For sleep to be perfect, the circulation of the blood must be free; that fluid must be equally distributed, neither this part nor that being furnished with either more or less than its customary and natural quantity.

The respiratory functions must be adequately performed, the blood fully aerated, or sleep is either banished or it passes into the opposite extreme.

A disturbed state of any of the great secreting organs,—the liver, the kidneys, the skin, &c.,—almost always prevents sleep, or renders it imperfect. It irritates the nervous system either to so great a degree that sleep is altogether prevented, or to such a degree as to render sleep only partial and unrefreshing. It has been observed that, in perfect sleep, the purely mental faculties, the external senses, and the power over the voluntary muscles, are all totally suspended. But sleep is anything but always perfect; more or less of these attributes are often still retained. Imagination, the last to yield to the powers of sleep, frequently does not yield at all; but, freed from the fetters with which the judgment and the faculty of association confine it in the waking hours, roams through regions of its own formation—regions, it may be, with cloudless skies, and all beauty and sunniness, or regions of darkness and horrors. But not only the imagination, sometimes more or less of memory is left, and the man dreams of the past as if it were present; and, judgment and association being still asleep, things of opposite character are made to coincide, time and even possibilities are violated, and all the absurdities of dreaming are the

result. Often, again, the sleep is even still more imperfect; the judgment partially enters on the scene, and then the dreams assume a vividness and correctness at times with difficulty separated from realities, and often confounded with them. Hence visions and all the strange, marvellous tales of visits from the other world; and, tinged and biassed by some leading current of thought, the vision is perhaps considered to be a direct warning from the Omnipotent, or a threatening of the vengeance of a departed spirit for the injustice or forgetfulness, or, it may be, the crimes of the dreamer. One or more of the external senses are sometimes brought into play, and the head off the pillow, or hanging out of bed, is conjured into falling down a precipice, a pile of clothes, or the arrangement of a window-curtain into the impersonation of some departed friend, or unearthly visiter, or midnight assassin. Sometimes the voluntary muscles are in part, or wholly, restored to the governance of the will, and the curious phenomenon of sleep-walking is the consequence.

The cause of all these is most commonly, as I have said, a disturbed condition of one or more of the organic functions, producing irritability

of the nervous system, and preventing the absolute repose of the intellectual or motor powers, or of the external senses. But the less perfect the sleep, the less of nervous energy does it restore, the less does it advantage the sleeper;

> A sleep without dreams, after a rough day
> Of toil, is what we covet most.—BYRON.

The remedies for imperfect and for lethargic sleep are many, varying with their cause and with the condition, the age, and the habits of the patient. All mention of medicinal or pharmaceutical agents has been conscientiously avoided by me throughout this work; but it may be said that the remedy sometimes consists in depletion, sometimes in tonics, sometimes in opiates; that in one case the scale of diet must be lowered, in another it must be raised; that by this person animal food must be abstained from, by that it must be eaten in greater quantity.

Cold and heat constitute the most simple, and often the most efficacious means of inducing sleep, or of tranquillising it, or of relieving it from its torpor. Sponging the whole surface of the skin with cold, or tepid, or hot water; fomenting the feet and legs with warm water; the application of cold or warm water to the

head; these often constitute sufficiently energetic and perfectly safe sedatives, and are often the simple but effectual means of procuring for the invalid the restorative blessing of perfect sleep.

To secure sleep, that most necessary appendage to health and to happiness, the mind must be tranquil, its powers moderately used, but not overworked, and its several faculties kept in proper subjection to one another; the muscles of voluntary motion must be exercised; the stomach kept free from disturbance; the circulating and respiratory organs, the functions of secretion and excretion, all perform their several duties without appreciable inconvenience*: and, to promote the same end, the bed-room should be well ventilated and cool, the bed somewhat hard, the head well elevated, the feet kept warm, the bed-clothes sufficient to maintain the bodily heat without unduly confining it, the room should be dark, and the silence perfect.

* The effect of a plain, and even spare diet, and a contented mind, in rendering sleep at once light and perfect, is beautifully expressed in the following passage:—

Vivitur parvo bene, cui paternum
Splendet in mensâ tenui salinum,
Nec leves somnos timor aut cupido
Sordidus aufert.—HORACE.

As Dr. Gregory beautifully says in the words with which I have headed this chapter,—and it is a fit conclusion to the subject, an important lesson to the gourmand, the intemperate, the slothful, the wanderer from the paths of rectitude,—"Light and perfect sleep is the reward and the solace of labour, virtue, and temperance, and it is not readily granted to the undeserving."

APPENDIX.

It is intended, in this appendix, to give a few illustrations of some of the practical remarks that are contained in the foregoing work. These illustrations will consist of *fictitious cases.* It would have been much easier to have given real cases; but two reasons have led the author to prefer the former of these modes. It is hoped that either of these reasons will be thought to be sufficient. One is, that it is only fair to infer that this work will fall into the hands of many that have been under the author's care; and it would necessarily be most ungrateful to their feelings to find themselves and their sufferings figuring, although under a concealed name, as illustrations of a work on any subject. The other reason is, that the cases will perhaps be more vivid illustrations by being fictitious. But although the cases are fictitious, cases very like them occur in every medical man's yearly experience; and no

single matter of practical importance has been interwoven with the fiction, that has not been fully corroborated by the author's personal observation. Should the author's present opinion of this practice be borne out by the event,—if this work ever reach a second edition,—these cases will probably be largely added to. As these cases are not intended to *prove* the truth of the doctrines contained in the work,—the greater part of them seem to require no further proof than the universal testimony of the whole medical profession,—but are only meant *to impress* those doctrines on the reader's mind, it seems that fictitious cases will answer every purpose that the narration of real cases could possibly serve.

Mr. Thomas Eastwood, aged forty-five, by trade a maltster, was attacked on the evening of Friday, the 20th of June, in the year ——, with a sense of swimming and dizziness in the head, after which he for a few minutes lost his consciousness. On recovering from this, his head felt heavy, his ideas confused, his eye-sight dim, his hearing dull. When he had, by the usual means, been still further relieved from this state of mental torpor, there remained a less aggravated degree of these symptoms; but still his judgment and memory were sensibly impaired, his imagination gloomy, and his external senses materially dulled. On inquiring into the further history of the case, Mr. E. said that he had always

lived a regular life; that he had gone early to bed, and risen early in the morning; that a portion of every day had been spent in the open air; and that his diet had always been as plain and simple as that of the persons in his *situation* of life usually is. He had never felt himself unwell, nor ever had a day's illness, with the exception of an occasional cold, from his boyhood, until within the last six months; and since that time he had certainly felt less active in body, and less capable of attending to his business. He had before then thought himself over-worked, having had all the complicated concerns of a very large business to attend to; and, partly induced by this, partly by better and less selfish motives, he had admitted into partnership with him a nephew, an active and steady young man, wholly dependent upon him for support. His nephew had proved very useful (?) to him; had attended to the out-door business, such as travelling for orders and the like. On still closer inquiry, it appeared that Mr. E. had always been accustomed to eat meat twice a day, and to take three or four glasses of wine to his dinner and after it. That, partly in the way of his business, he had always kept, and prided himself on keeping a first-rate tap of ale, of which he generally took half a pint to his dinner, and rather more than that to his supper. "A small glass of gin or brandy, drowned in a tumbler of water, and a single pipe of

tobacco" usually wound up the day. "But why are you asking me these questions? I have done this all my life, and never felt any inconvenience from it. You surely can't ascribe my complaints to this? My dinner always agrees with me; I sleep well; it is my head that is wrong; I'm all right at my stomach."—"Well, Mr. Eastwood, you *may* be 'all right' at your stomach; but you eat too much, and your food is of too nourishing a kind; you drink too much; you work too little. You must eat meat only once a day, and that most sparingly. You must, if you possibly can, leave off wine, and take only a quarter of a pint of ale to your dinner, and *none* at night. You must return to the laborious parts of your business, or provide yourself with other as laborious and as interesting employment; and such employment ought to be in the open air. Can you leave your business for six months, and afford the expense? if so, go and travel, walking as much as you can every day. You must keep your hair short, and wash your head night and morning in cold water. If you can manage it, when the weather gets hot, go to the coast, and take a course of sea-bathing for six weeks or two months. If, in a few weeks from this time, you should not find yourself getting better, you must leave off malt-liquor entirely; and if, then, the improvement in your health and mental faculties be not sensible and progressive, you must leave off

animal food likewise, and live wholly on vegetable food. You must eat little or no supper, and sleep in a large, cool, and well-ventilated chamber, your head and shoulders being well elevated with pillows. Such, Sir, is the course that you must pursue to regain your health; and physic, without this, would be worthless to you—it would do you no good."

Mary Jones, aged thirty, a housemaid in a gentleman's family, says, that her principal complaints consist of frequent attacks of violent headach, accompanied or preceded by severe sickness and vomiting. These attacks are very irregular, both as to time and duration. In general they come on every week or ten days; oftener in the afternoon than at any other time. When the attack comes on, she goes to bed, takes an emetic to empty her stomach, and, in an hour or two afterwards, a dose of opening medicine, and is usually quite well on the following morning. Between these attacks, and in all other respects, she is in perfect health. Pointed questioning on the minute history of the case brought out the following particulars:—She is the oldest of seven children. Her father was a weaver, whose slender earnings were insufficient to support his family. To assist in providing food, clothes, and rent, her mother took in washing, and went out charing. She being the oldest, had to assist her mother at the wash-tub, to

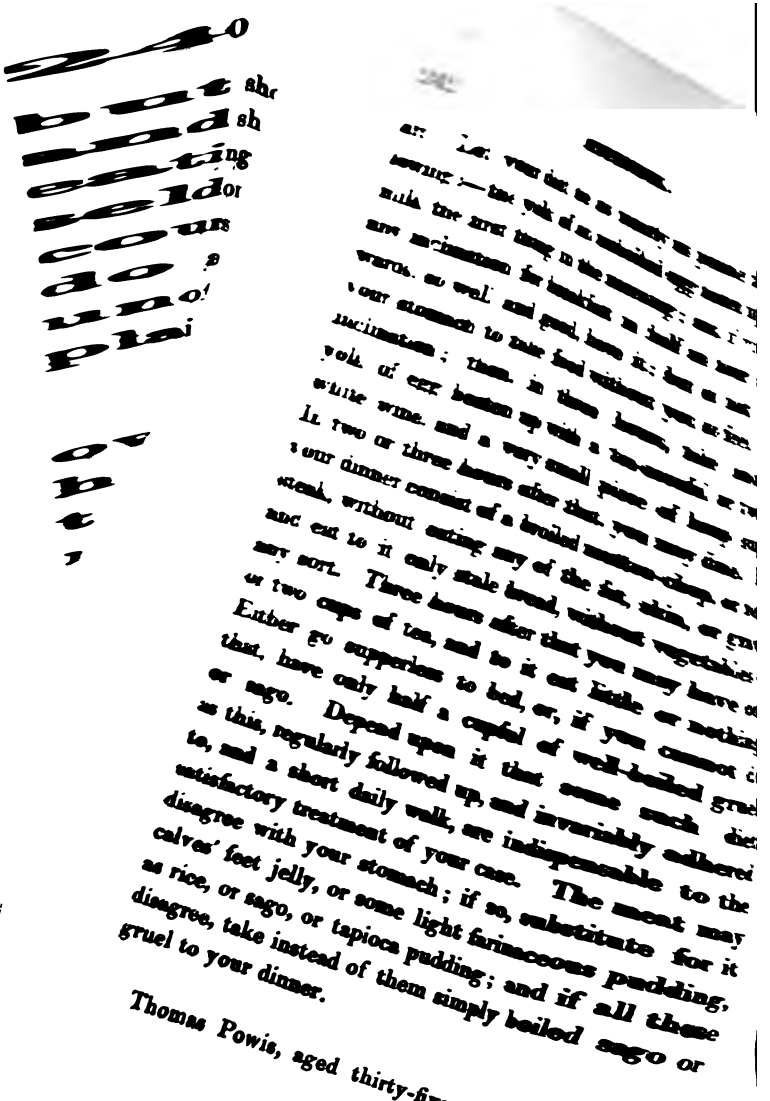
attend to the younger children, and to prepare the meals for the family. Their food consisted chiefly of potatoes, milk, bread, the vegetables from a small garden attached to the house, and, once a year, a side of pig made into bacon, the other flitch being sold to help to pay the rent. The pig they contrived to keep with the refuse of the garden, the few offals of food from the house, and what they could collect from the houses of their richer neighbours. This state of things continued until, her mother having died some long time before, her father died, about two years since, when she and her two younger sisters went into service: her brothers had been previously apprenticed by the parish to neighbouring tradesmen. At first she procured "a place of all work," where the food, although better than she had been accustomed to, was yet very simple, and where she had a very great deal of work to do. Wishing to better herself, she left her place about twelve months ago, and obtained the situation that she at present fills. She had always enjoyed good health until six months since. She does not consider herself to be a great eater. She goes early to bed, and gets up early, and is sure she has plenty of work. She is allowed half a pint of ale to her dinner, and half a pint to her supper, which she thinks does her good. She enjoys her supper more than any other meal. She has hardly any appetite for her break-

fast. She generally feels languid in the morning. She must say that she lives better, that her food is richer, and in greater plenty than she ever had before. She does sometimes go to the cupboard for something to eat between her meals; she feels faint, and as if she could not wait for the regular meal-time. She is very fond of sweets and pastry, but is not allowed to have any, except at dinner. She hardly ever feels uncomfortable after eating; and the digestion of her food never gives her pain. She does sometimes feel full and swelled at her stomach about an hour after dinner, and then often loosens her stays for ease.—In this fictitious, but still very commonly and frequently occurring case, the sudden change of habits, the richer and more abundant food, the less severe bodily labour, the confinement to the house, are probably the principal causes of the ailments. Such a patient should never eat between the meals; should eat only of one, and that a very simple kind of food at each meal; should go supperless to bed; should take no ale, nor any other strong or stimulating drink; should eat no sweets nor pastry; and such restrictions should be made a *sine qud non* in the treatment. She should eat slowly, masticate her food well, mixing it intimately with the saliva. She should get into the open air, if possible, at least once a day, and stop in it as long as circumstances will permit. She should make a point of working harder,

but should never eat her meals when she is tired; and she should sit for fifteen or twenty minutes after eating each meal. A rigid attention to these matters seldom fails in giving relief to such cases; while courses of medicine, without such attention, seldom do any good, and, I fear it must be added, not unoften aggravate, rather than relieve the complaints.

Susan Jackson, aged seventeen, complains of pain over the pit of the stomach, which begins about an hour after eating, and continues for an indefinite time, varying from half an hour to two hours or more. The pain is generally preceded by a feeling of fulness, and often goes off suddenly, leaving her perfectly free from pain. This state of things continues for a longer or shorter time, varying, as she thinks, with the duration of the previous pain, and is followed by a sense of sinking at the stomach, sometimes attended with an appetite, or rather a *hungering after* food; but this is more usually not the case. She always finds instant relief by taking any kind of food; and yet she dreads, even when she does so, the subsequent and almost invariably occurring pain at her stomach. She has no other ailment to complain of.—On closer questioning, the following facts were elicited:—She is apprenticed to a straw-bonnet maker; is at work from eight in the

morning until nine at night, and in the busy time of the year often much later. As soon as the day's work is over, quite exhausted, she eats her supper, and goes instantly to bed. Has been in her present situation about two years, and soon after going to it she began to fall off in her flesh, and to be troubled at her stomach.—"I am sorry for you; your business does not suit you. I much fear that you will never get well if you continue to follow it; but you can try how far your health may be reconciled to your employment. The most important rule that I can give you is, to take what food you want in the earlier part of the day, and to eat little or nothing in the after part."—"But, Sir, I have no appetite till dinner time. I seldom eat any breakfast to speak of."—"Truly, no! nor, if the habits of life you have hitherto used are not changed, will you ever have an appetite for your earlier meals? if you eat supper, perhaps for you a heavy meal, and go to bed directly afterwards; if you take your meals irregularly, and when you feel faint, and exhausted, and *sinking* at your stomach; and if you eat indiscriminately whatever may happen to be set before you. The principal things that you must attend to are regular times for eating; what food you ought to take at your meals; to take more at your earlier than at your later meals; to eat little or no supper; and to do your best to take a longer or shorter walk every day in the open



ance. You are in a hurry to finish your dinner;—the rule of a medical man is, to eat three times in the twenty-four hours, and never sit down to table with a half an hour's work or walk still before you. Therefore, if you have to take food without your appetite, or your stomach to take food, leave it; but if you have an appetite, and your stomach to take food, then, in three hours, take another meal of any kind you like, only not quite so much as you would have taken if you had waited for your dinner. In two or three hours after that, you may take a little wine, and a very small piece of bread, or a little meat, without eating any of the fat, skin, or gristle. In two or three hours after that, you may have your dinner consist of a broiled mutton-chop, or a beefsteak, without eating any of the fat, skin, or gristle, and eat to it only stale bread, without vegetables of any sort. Three hours after that you may have a cup or two cups of tea, and to it eat little or nothing. Either go supperless to bed, or, if you cannot do that, have only half a cupful of well-boiled gruel or sago. Depend upon it that some such diet as this, regularly followed up, and invariably adhered to, and a short daily walk, are indispensable to the satisfactory treatment of your case. The meat may disagree with your stomach; if so, substitute for it calves' feet jelly, or some light farinaceous pudding, as rice, or sago, or tapioca pudding; and if all these disagree, take instead of them simply boiled sago or gruel to your dinner.

Thomas Powis, aged thirty-five, a smith, com-

ins of want of appetite, frequent dryness of the outh and fauces, and says that this is sometimes tended with thirst, but is often present without it. e is frequently feverish, especially at night in bed, ith much restlessness. He often finds this so ex- ssive as to be quite unbearable; and to cool himself e frequently jumps out of bed, and walks about the ed-room for half an hour or more at a time. Gene- ally, during this feverish paroxysm, his mind is fretful and irritable to the last degree. He some- times fears that he shall lose his senses, or lose the command over his actions in one of these fits, and do his wife or children some injury. He is hardly sensible of any pain or local uneasiness during the paroxysm; but, on close questioning, thinks that he has at times felt some little pain or uneasiness in the bowels. When he gets cool, sleep returns; but it is much disturbed with frightful dreams, or else is oppressively deep and profound. He rises in the morning either feverish and unrefreshed, or dull, heavy, stupid, his ideas confused, and his body unfitted for his work. He feels languid and low-spirited, and then sometimes fears that he may be tempted to destroy himself. A [illegible] of spirits always "sets him to rights, and makes a new man of him," when he feels in this way. He has a good deal of flatulence, and is always relieved when he gets rid of it. He has sometimes pain in his shoul-

dors and back; but he thinks it is *rheumatism* (?). His complexion is sallowish; his skin loose; his flesh flabby; his eyes red-looking, and a little blood-shot; his lips pale and dry; his tongue white, as if it had been boiled; his hands feel cold and clammy to the touch. His bowels are generally regular; but occasionally he has slight attacks of diarrhœa. Reader! this is a suspicious case. 'Tis fifty to one that this man is a dram-drinker. Let us ask him: "How often have you been tipsy within the last month?"—"Me tipsy! sir; why, it takes a good deal to make me tipsy: but I must say, it takes less to affect me than it used to do."—"I asked you, my good man, how often you have been tipsy within the last month. Recollect yourself, and answer the question truly." "Why, I can't exactly pretend to say *how often*; but I am sure I drink less than many of the men in our shop."—"Do you ever drink spirits before your dinner?"—"Why, yes, I can't say but I do. I feel so low in the morning, that I couldn't live without a drop of something to revive me." And so on. It is needless to question further; the case is clear: the [illegible] must leave off spirits, or, to use a strange-sounding but very common, and therefore sufficiently expressive form of speech, it will soon leave off him. He must live for weeks and months on the plainest, and lightest, and least stimulating food: he must eat nothing but the simplest fari-

nacea; invigorate his system by exercise and fresh air, and abide by the maxim, "early to bed," or his case is hopeless. He is a candidate for a premature, and unhonoured, and perhaps unlamented, grave!

Mr. Daventry, aged fifty, is the senior partner in an extensive mercantile house. Complains that his food does him no good; that he eats it without the relish that he used to have; that it does not seem to leave his stomach as it ought to do, but fills him with flatulence; that he is much troubled with acrid eructations; that his mind and body seem to be alike oppressed, and incapable of active exertion. Says that, after all the toil and uphill work of his earlier life, when the great object of his ambition, an ample independence, is his own; when his name, and firm, and credit, have obtained a high degree of eminence in the mercantile world; when every thing, as far as external circumstances go, seems to smile upon him; he is, like Tantalus, unable to enjoy it; he carries about some, to him unaccountable, incapacity for relishing his good fortunes. If he has any little distance to go, that he would formerly have walked, he now feels as if he could not do so, and orders the carriage; if he has any little matter to arrange or look over, he feels incapable of making the effort required for it, and either gets one of the clerks or one of his partners to do it for him; or, if that can-

not be, he puts it off from day to day. "I have been thinking, sir, for some time, of consulting you on my case, but I could not muster resolution; and in my occasional better moments, I thought it would go off. I candidly confess I should not have come now but for the importunities of my wife."—"How do you live, sir?"—"Live! doctor; I don't live: I suffer a perpetual martyrdom. Live, quotha! If I do live, I live miserably; that's *how* I live. But I suppose you mean *what do I eat?* Why! it's an effort to me to eat anything. I pick a little at breakfast; but it must be something that relishes, or my stomach turns against food, and I eat nothing. I have a little bit of fish, or a thin slice or two of bacon, or some such thing, with sometimes an egg, and my bread and butter, and a cup or two of coffee, to my breakfast. But it's most terrible work to get it down, I can tell you."—"Well! and what do you do after that?"—"Why, I spell over the newspapers; read, or try to read, my letters, or kill time by twirling my thumbs, or counting my fingers, till eleven. I then crawl to the carriage and ride to the counting-house, peep in and show myself, get away as fast as I can; and then, either call in on one or two old cronies of mine, or return home."—"Pray, sir, do you eat or drink anything before dinner?"—"Why, yes, I generally call in on my way at ——'s, a famous house—you know it, doctor, I dare say.—

and get a basin of soup, and a single glass of wine to keep it on my stomach. Well! I've nothing else till dinner time; and then I have always a few friends to dine with me, for I can't bear to be left to myself. But I don't eat much to my dinner. A bit of fish, and a single slice of meat, a bit of old cheese, and two or three glasses of wine, is all I have." But it is unnecessary to go farther. Mr. Daventry is a martyr to repletion and inactivity. The incentive to exertion is gone—the means of luxurious sensual gratification have been attained; and he overfeeds his stomach and his system; while the exercise, which, if sufficient, might carry it off, is wholly neglected. Such a man must be humoured. He must be provided with some motive for an alteration in his mode of life. Change his scene of action; let him have some given place to go to and return from: and, meanwhile, set him to weigh his food and measure his drink, and time his meals by a stop-watch. In fact, he must be treated like a horse in a mill; he must be blinded to the purpose of the injunctions, and be kept from wandering out of the prescribed track. If such a man could be persuaded that the smell of newly-turned earth would be of great service to him, and so could be induced to dig in a garden for an hour or two a day, or follow a ploughman in the newly-turned furrow, as he crosses and recrosses a field; or could be brought to believe that some

high-sounding mineral water, that he has heard of, would do him good, if he would but walk half a mile or a mile before taking it, and twice that distance after it, every day; or be in any other way cheated into taking exercise and living abstemiously;—the best possible chance would be afforded to him of a restoration to his health, his bodily vigour, his cheerfulness, and activity of mind.

Miss Emily Saundersen, aged twenty, complains of a sense of heat and pain after eating. The pain is often dreadfully acute, and shoots and darts through the stomach, sometimes through the bowels, and occasionally up to her chest. Complains of occasional palpitation, some dry tickling cough, and occasional difficulty of breathing. At times has headach, chiefly affecting one side of the head, and usually settling on one temple. This often resembles the same shooting and darting nature as the pain at the stomach. Finds that her complaints are aggravated by using any unusual exertion. Has occasional pain in the back, but thinks it proceeds from the stomach. Feels a weariness of the limbs after a very little walking, and her feet and legs sometimes ache after doing so. Her feet sometimes get numbed as if they were *asleep*. Has a general sense of debility and languor. Her spirits are sometimes depressed; but has in general a cheerful and buoyant

turn of mind: thinks, however, that her spirits are often too great for her strength. They have been much more variable since the accession of her present complaints; and sometimes she feels very low, she cannot tell why, and then not unfrequently she bursts out into a fit of uncontrollable weeping. Thinks she does not lace her stays tightly, but acknowledges that she is rather particular as to her figure, and that she cannot bear to look loose and slovenly in her dress. Her mother has, from her childhood, been very particular on this point, and has often sent her up stairs again "to lace her stays properly," when she has not thought them tight enough. There is considerable tenderness on even moderate pressure over the spine, and a darting pain is at certain points caused by it, this pain shooting through the stomach and bowels.—This case illustrates the debilitating and irritating effects of tight lacing. The muscles of the spine have been weakened by the little exercise the stays have allowed to them, and by the pressure of the stays upon them; while the nerves of the spine, and the minute ramifications of those nerves that are spread over the stomach, have been brought into a state of morbid irritability by that pressure; and the whole frame has been enervated by the indolent habits that these complaints have produced, or given countenance to. If she be a girl of strong mind, this may be told to her at once

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should not attempt it. You should be in the recumbent posture the greater part of your time, and sit as little as you can help, until the nerves have regained their lost quietude. Then, by degrees, walk more and more — passing gradually from a gentle to a moderate, from a moderate to a quick walk — and then add thereto some more active exercise, some kind of exercise that will bring into use and strengthen the muscles of your back. Meanwhile, you must go early to bed, live simply, and take only a light and unstimulating kind of food. In addition to these matters, it will be well if you can regulate your spirits, and restrain them when they are overflowing and exuberant; for, allowing them to run their course without such restraint, will be followed by a more than counter-balancing depression of spirits, and languor of the powers both of body and mind."

THE END.

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Common Salt.	Chloride of Magnesium.	Total of Saline Constituents.	Specific Gravity.	AUTHORITY, and Date of Analysis.
	0·3488	9·068	1·0007	Sir C. Scudamore, 1816.
2	- -8	27·736	1·0010	Dr. Godden Jones, 1810.
3	- -8	13·644	- -	
	- -	9·12	- -	
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e.	- -	4·02	- -	
	- -	9·24	- -	

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42·5 -	1016·5	1·0110	
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21·8 -	556.	1·0051